



Missouri Department of Natural Resources
Air Pollution Control Program

PERMIT TO OPERATE

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to operate the air contaminant source(s) described below, in accordance with the laws, rules, and conditions set forth here in.

Operating Permit Number: OP2006-033
Expiration Date: JUN 19 2011
Installation ID Number: 510-0697
Project Number: 2002-01-062

Installation Name and Address

Sigma-Aldrich Company
3500 Dekalb Street
St. Louis, MO 63118
City of St. Louis

Parent Company's Name and Address

Sigma-Aldrich Corporation
P.O. Box 14508
St. Louis, MO 63178

Installation Description:

Sigma-Aldrich Company is a manufacturer and distributor of about 14,000 research biochemicals. Some of these biochemicals are manufactured at Sigma-Aldrich Company's three installations located at 3500 Dekalb Street (Dekalb), 3300 South Second Street (Cherokee), and 3506 South Broadway (Broadway). Since the three installations are located close to each other and the property has become contiguous, a single Title V Permit is being issued for the three installations. The production processes at the three installations utilize several small-scale batch operations to manufacture products. Typical chemical unit operations that occur at the installations include chemical synthesis (reactions), distillation (atmospheric or vacuum), crystallization, drying and ion exchange chromatography. The installation will be located in a moderate non-attainment area for 8-hour ozone, effective June 15, 2004.

JUN 20 2006

Effective Date

Director or Designee
Department of Natural Resources

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I. Installation Description and Equipment Listing

INSTALLATION DESCRIPTION

Sigma-Aldrich Company is a manufacturer and distributor of about 14,000 research biochemicals. Some of these biochemicals are manufactured at Sigma-Aldrich Company's three installations located at 3500 Dekalb Street (Dekalb), 3300 South Second Street (Cherokee), and 3506 South Broadway (Broadway). Since the three facilities are located close to each other and the property has become contiguous due to recent purchases, a single Title V Permit is being issued. The production processes at the three installations utilize several small-scale batch operations to manufacture products. Typical chemical unit operations that occur at the installations include chemical synthesis (reactions), distillation (atmospheric or vacuum), crystallization, drying and ion exchange chromatography.

Dekalb Installation Reported Air Pollutant Emissions, tons per year							
Year	Particulate Matter ≤ Ten Microns (PM-10)	Sulfur Oxides (SO _x)	Nitrogen Oxides (NO _x)	Volatile Organic Compounds (VOC)	Carbon Monoxide (CO)	Lead (Pb)	Hazardous Air Pollutants (HAPs)
1998	0.25	0.02	3.29	23.90	2.76	—	2.58
1999	0.26	0.02	3.47	22.69	2.92	—	1.24
2000	0.28	0.02	3.69	11.66	3.11	—	1.87
2001	0.26	0.02	3.46	19.04	2.90	—	1.56
2002	0.26	0.02	3.38	16.50	2.84	—	3.02
Cherokee Installation Reported Air Pollutant Emissions, tons per year							
1998	0.28	0.02	3.80	37.96	3.20	—	0.06
1999	0.35	0.03	4.55	34.78	3.83	—	0.07
2000	0.35	0.03	4.55	48.04	4.11	—	0.07
2001	0.42	0.03	5.51	86.70	4.63	—	0.12
2002	0.42	0.03	5.51	109.54	4.63	-	0.12
Broadway Installation Reported Air Pollutant Emissions, tons per year							
1998							
1999							
2000	0.13	0.01	1.68	0.26	1.41	---	0.00
2001	0.00	---	---	0.17	---	---	0.13
2002	0.00	---	---		---	---	0.08

EMISSION UNITS WITH LIMITATIONS

The following list provides a description of the equipment at this installation, which emit air pollutants and which are identified as having unit-specific emission limitations.

I. Dekalb Installation Emission Units (Major pieces of equipment only)

Emission Unit #	Description of Emission Unit
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1. Miscellaneous Emission Units at Dekalb

EU0010	10.4 MMBtu/hr Boiler-0002 (EP-1802)
EU0020	10.4 MMBtu/hr Boiler-0003 (EP-1803)
EU0030	Paint Spray Booth (EP 1501)

2. General Equipment Throughout Dekalb: K-Building and XP Cold-room, excluding BC Building (Reported as EP 1401)

EU0040	50 Gallon Reactor (EQP No. 1RT-0013)
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EU0050	30 Gallon Catch Tank (EQP No. 1RT-0013-T01)
EU0060	100 Gallon Reactor (EQP No. 1RT-0011)
EU0070	50 Gallon Catch Tank (EQP No. 1RT-0011-T01)
EU0080	500 Gallon Reactor (EQP No. 1RT-0015)
EU0090	200 Gallon Catch Tank (EQP No. 1RT-0015-T01)
EU0100	1,200 Gallon Reactor (EQP No. 1RT-0012)
EU0110	500 Gallon Catch Tank (EQP No. 1RT-0012-T01)
EU0120	1,500 Gallon Jacketed Crystallizer (EQP No. 1RT-0019)
EU0130	10 Gallon Portable Glasslined Reactor (EQP No. 1RT-0014)
EU0140	30 Gallon Portable Glasslined Reactor (EQP No. 1RT-0027)
EU0150	Portable Stainless Steel Reactor
EU0160	500 Gallon Glass Lined Crystallizer (EQP No. 1RT-0026)
EU0170	500 Gallon Glass Lined Crystallizer (EQP No. 1RT-0025)
EU0180	Centrifuge (EQP No. 1CF-0138)
EU0190	11,000 Gallon Filter Press (EQP No. 1PR-0015)
EU0200	Neutsche Filter (EQP No. NF-1)
EU0210	2,000 Gallon Press Tank-North (EQP No. 1RT-0032)
EU0220	2,000 Gallon Press Tank-South (EQP No. 1RT-0033)
EU0230	2,000 Gallon Vessel-F (Process Solvent Tank) (EQP No. 1T-0305)
EU0240	2,000 Gallon Press Tank (EQP No. 1T-0013)
EU0250	2,000 Gallon Press Tank (EQP No. 1T-0014)
EU0260	Filter Press (EQP No. 1PR-0017)
EU0270	Filter Press (EQP No. 1PR-0018)
EU0280	140 Gallon Process Holding Tank (EQP No. 1V-0012)
EU0290	Centrifuge (EQP No. 1CF-0077)
EU0300	Centrifuge (EQP No. 1CF-0079)
EU0310	Centrifuge (EQP No. 1CF-0080)
EU0320	Centrifuge (EQP No. 1CF-0082)
EU0330	Column (EQP No. 1COL-0012)
EU0340	Column (EQP No. 1COL-0013)
EU0350	150 Gallon Centrifuge (EQP No. 1CF-0087)
EU0360	150 Gallon Centrifuge (EQP No. 1CF-0088)
EU0370	160 Gallon Fractionation Process Tank (EQP No. 1T-0357)
EU0380	25 Gallon Fractionation Process Tank (EQP No. 1T-0358)
EU0390	400 Gallon Precipitation Tank-East (EQP No. 1T-0039)
EU0400	400 Gallon Precipitation Tank-West (EQP No. 1T-0040)

3. General Equipment – BC building (Reported as EP 1402)

EU0410	1,000 Gallon Crystallizer (EQP No. 1RT-0028)
EU0420	20 Gallon Reactor (EQP No. 1RT-0001)
EU0430	30 Gallon Catch Tank (EQP No. 1T-0002)
EU0440	50 Gallon Reactor (EQP No. 1RT-0002)
EU0450	100 Gallon Reactor (EQP No. 1RT-0003)
EU0460	100 Gallon Catch Tank (EQP No. 1RT-0003-T42)
EU0470	500 Gallon Reactor (EQP No. 1RT-0004)
EU0480	100 Gallon Catch Tank (EQP No. 1RT-0004-T04)
EU0490	500 Gallon Reactor (EQP No. 1RT-0005)
EU0500	100 Gallon Catch Tank (EQP No. 1RT-0005-T05)
EU0510	1000 Gallon Reactor (EQP No. 1RT-0006)
EU0520	300 Gallon Catch Tank (EQP No. 1RT-0006-T01)
EU0530	750 Gallon Receiver (EQP No. 1V-0003)

4. Dye Lab Area in BC Building (Reported as EP 1402)

EU0540	50 Gallon Reactor (EQP No. 1RT-0008)
EU0550	50 Gallon Catch Tank (EQP No. 1RT-0008-T01)

EU0560	50 Gallon Reactor (EQP No. 1RT-0007)
EU0570	50 Gallon Catch Tank (EQP No. 1RT-0007-T01)
EU0580	200 Gallon Reactor (EQP No. 1RT-0030)
EU0590	100 Gallon Catch Tank (EQP No. 1RT-0030-T01)
EU0600	100 Gallon Reactor (EQP No. 1RT-0031)
EU0610	100 Gallon Catch Tank (EQP No. 1RT-0031-T01)
5. Raw Material Storage Tanks and Drum Storage Area	
EU0620	12,000 Gallon Denatured Alcohol Storage Tank (EQP No. T-400)
EU0630	12,000 Gallon Methanol Storage Tank (EQP No. T-402)
EU0640	Fifty Five (55) Gallon Drums Storage Area

II. Cherokee Installation Emission Units (Major pieces of equipment only)

<u>Emission Unit #</u>	<u>Description of Emission Unit</u>
1. Miscellaneous Emission Units at Cherokee	
EU0650	12.55 MMBtu/hr Gas Fired Boiler-0001 (EP-3801)
EU0660	12.55 MMBtu/hr Gas Fired Boiler-0002 (EP-3802)
EU0670	12.55 MMBtu/hr Boiler (EP-3803)
EU0680	Paint Spray booth (EP-3501)
EU0681	Grinder (EP-402)
2. General Equipment throughout XY Building(Reported as EP 3401)	
EU0690	6,000 Liter A-Vessel (EQP No. 3RT-0127)
EU0700	12,000 Liter B-Vessel (EQP No. 3RT-0126)
EU0710	3,000 Liter C-Vessel (EQP No. 3RT-0128)
EU0720	Dye Mix Batch Operation
EU0730	Filling Equipment Lines 1 and 2
EU0740	Powder Weigh and Repackaging Operation
3. Cherokee-T Building-West (Reported as EP 3402)	
EU0750	750 Gallon Reactor (EQP No. 3RT-0001)
EU0760	350 Gallon Catch Tank (EQP No. 3RT-0001-T26)
EU0770	1,000 Gallon Reactor (EQP No. 3RT-0002)
EU0780	350 Gallon Catch Tank (EPQ No. 3RT-0002-T27)
EU0790	2,000 Gallon Reactor (EQP No. 3RT-0004)
EU0800	1,000 Gallon Catch Tank (EQP No. 3RT-0004-T29)
EU0810	20 Gallon Reactor (EQP No. 3RT-0071)
EU0820	10 Gallon Catch Tank (EQP No. 3RT-0071-T72)
EU0830	50 Gallon Reactor (EQP No. 3RT-0008)
EU0840	50 Gallon Catch Tank (EQP No. 3RT-0008-T09)
EU0850	1,500 Gallon Crystallizer (EQP No. 3RT-0003)
EU0860	1,800 Gallon Crystallizer (EQP No. 3V-0010)
EU0870	1,000 Gallon Slurry Tank (EQP No. 3T-0006)
EU0880	4,000 Gallon Sodium Vinyl Sulfonate Tank 1 (EQP No. 3T-0152)
EU0890	2,000 Gallon Sodium Vinyl Sulfonate Tank 2 (EQP No. 3T-0153)
EU0900	2,000 Gallon Sodium Vinyl Sulfonate Tank 3 (EQP No. 3T-0154)
4. T Building West Buffer Line Reactor System	
EU0910	5,000 Gallon Reactor (EQP No. 3RT-0010)
EU0920	1,000 Gallon Catch Tank (EQP No. 3RT-0010-V01)
EU0930	3,000 Gallon Crystallizer (EQP No. 3RT-0005)
EU0940	117 Gallon Centrifuge (EQP No. 3CF-0003)
5. T-Building-East (Reported as EP 3403)	
EU0950	100 Gallon Reactor (EQP No. 3RT-1000)
EU0960	50 Gallon Receiver (EQP No. 3RT-1000-T01)

EU0970	200 Gallon Reactor (EQP No. 3RT-2000)
EU0980	100 Gallon Receiver (EQP No. 3RT-2000-T01)
EU0990	750 Gallon Reactor (EQP No. 3RT-7500)
EU1000	300 Gallon Receiver (EQP No. 3RT-7500-T01)
EU1010	3,000 Gallon Crystallizer (EQP No. 3RT-3000)
EU1020	50 Gallon Receiver (EQP No. 3RT-3000-T01)
EU1030	800 kg Wet Cake Filter Dryer (EQP No. 3FI-0046)
EU1040	500 Gallon Receiver (EQP No. 3FI-0046-T02)
EU1050	Shelf Dryer (EQP No. 3D-0020)
EU1060	Contained Filter (EQP No. 3FI-0047)
EU1070	100 Gallon Receiver (EQP No. 3FI-0047-T01)
EU1080	50 Liter Scale Reactor System (EQP No. 3RT-0500)
EU1090	20 Liter Receiver (EQP No. 3RT-0500-T02)
EU1100	50 Gallon Solution Addition Tank (EQP No. 3T-0121)
EU1110	200 Gallon Carbon Tank for Decolorization (EQP No. 3T-0116)
EU1120	Closed Loop 250° F Glycol System (EQP No. 3HTS-0001)
EU1130	Low Temperature Coolant System (EQP No. 3HTS-0002)
EU1131	45 Gallon Portable Nutsche Filter

III. Broadway Installation Emission Units

<u>Emission Unit #</u>	<u>Description of Emission Unit</u>
EU1140	12.55 MMBtu/hour Cleaver Brooks Natural Gas Fired Boiler
EU1150	Medical Liquid and Powder Nutrients Manufacturing Units

EMISSION UNITS WITHOUT LIMITATIONS

The following list provides a description of the equipment that does not have unit specific limitations at the time of permit issuance.

Description of Emission Source

Dekalb Installation

Bench Hoods throughout the installation (EP 1101 & 1102)
Walk-in Hoods throughout the installation (EP 1301 & 1302)
4.2 MMBtu/hr Boiler-0001 (EP-1801)
0.79 MMBtu/hour Cargocaire Commercial Dryer
170 HP Diesel Fire Pump
500 Gallon Diesel Storage Tank for Back-up Fire Pump
6,000 Gallon Mixed Solvents Storage Tank, T-217 (EP 910)
10,000 Gallon Mixed Solvents Storage Tank, T-218 (EP 911)
10,000 Gallon Mixed Solvents Storage Tank, T-219 (EP 912)
10,000 Gallon Mixed Solvents Storage Tank, T-220, (EP 913)
Roof HCl Tank (EP 917)
6,600 Gallon HCl Tank (EP-918)
Abrasive Blasting
Metal Parts Cleaner using Aqueous Solution (Formerly EP-1805)
Water Cooling Towers
Microbiology Fermenting Department
Shot Blaster
Three (3) Cambridge Direct-fired Heaters, 0.741 MMBtu/hr each
Eight (8) Hastings Indirect-fired Heaters, 0.3 MMBtu/hr each
1AHU-0025 (Trane Indirect-fired Heater, 0.12 MMBtu/hr)
1AHU-0036 (Trane Indirect-fired Heater, 0.35 MMBtu/hr)
1AHU-0047 (Indirect-fired Heater, 0.5 MMBtu/hr)
1AHU-0048 (Indirect-fired Heater, 0.5 MMBtu/hr)

1D-0024 (2 Reznor Indirect-fired Gas Burners, 0.2 MMBtu/hr)
1D-0025 (2 Reznor Indirect-fired Gas Burners, 0.2 MMBtu/hr)
1D-0026 (2 Reznor Indirect-fired Gas Burners, 0.05 MMBtu/hr)
1D-0037 (2 Reznor Indirect-fired Gas Burners, 0.4 MMBtu/hr)
1HGC-0001 (Direct-fired Heater, 0.54 MMBtu/hr)
1HGC-0002 (Direct-fired Heater, 0.54 MMBtu/hr)
1HGC-0003 (Direct-fired Heater, 0.54 MMBtu/hr)
1HGC-0004 (Direct-fired Heater, 0.54 MMBtu/hr)
1HGC-0012 (Direct-fired Heater, 0.596 MMBtu/hr)
1HGC-0013 (Direct-fired Heater, 0.596 MMBtu/hr)
1HGC-0014 (Direct-fired Heater, 0.54 MMBtu/hr)
1HGC-0015 (Direct-fired Heater, 0.54 MMBtu/hr)

Cherokee Installation

Bench Hoods throughout Cherokee (EP 3101 & 3102)
Walk-in Hoods throughout Cherokee (EP 3301 & 3302)
Bio-safety Hoods throughout Cherokee (EP 3101 & 3102)
Cold Cleaner using Aqueous Solution
Chemical Waste Storage Area
6,300 gallon HCl Tank V-28 (EP 3914)
6,300 gallon HCl Tank V-104 (EP 3915)
5,000 Gallon BCP Tank (3V-0126) (EP 3916)
12,000 Gallon Denatured Ethanol Storage Tank V-51 (EP-3901)
12,000 Gallon Acetone Storage Tank V-52
12,000 Gallon Methanol Storage Tank V-53 (EP-3903)
12,000 Gallon Denatured Ethanol Storage Tank V-54 (EP-3904)
12,000 Gallon Denatured Ethanol Storage Tank V-55 (EP-3905)
12,000 Gallon Methanol Storage Tank V-56 (EP-3906)
12,000 Gallon Methanol Storage Tank V-57 (EP-3907)
12,000 Gallon Mixed Solvent Storage Tank V-59 (EP-3908)
12,000 Gallon Mixed Solvent Storage Tank V-61 (EP-3909)
12,000 Gallon Mixed Solvent Storage Tank V-63 (EP-3910)
12,000 Gallon Mixed Solvent Storage Tank V-64 (EP-3911)
12,000 Gallon Mixed Solvent Storage Tank V-67 (EP-3912)
4,400 Gallon Waste Solvent Storage Tank V-69
4,400 Gallon Waste Solvent Storage Tank V-97
3D-0017 (2 Reznor Indirect-fired Gas Burners, 0.25 MMBtu/hr)
3HGC-0004 (Cambridge direct-fired heater, 0.65 MMBtu/hr)
3HG-0005 (Absolute Aire Direct-fired Heater, 1.555 MMBtu/hr)
3HGC-0005 (Cambridge Direct-fired Heater, 0.705 MMBtu/hr)
3HGC-0008 (Cambridge Direct-fired Heater, 0.65 MMBtu/hr)
3HGC-0010 (Cambridge Direct-fired Heater, 0.65 MMBtu/hr)
3HGC-0011 (Cambridge Direct-fired Heater, 0.65 MMBtu/hr)
3HGC-0012 (Cambridge Direct-fired Heater, 0.65 MMBtu/hr)
3HGC-0013 (Cambridge Direct-fired Heater, 0.65 MMBtu/hr)
3HGC-0018 (Cambridge Direct-fired Heater, 0.88 MMBtu/hr)
3HGC-0019 (Cambridge Direct-fired Heater, 0.705 MMBtu/hr)
3HGC-0020 (Cambridge Direct-fired Heater, 0.88 MMBtu/hr)

Broadway Installation

Bench Hoods throughout the Installation

DOCUMENTS INCORPORATED BY REFERENCE

These documents have been incorporated by reference into this permit.

Dekalb Installation

1. Construction Permit for Paint Booth Dated October 16, 1992
2. Construction Permit No. 99-10-071 Issued on December 7, 1999
3. Construction Permit No. 01-11-035 Issued on January 29, 2002
4. Construction Permit No. 02-12-027 Issued on January 22, 2003

Cherokee Installation

1. Construction Permit for Paint Booth Dated October 16, 1992
2. Permit Matter No. 99-10-072 Issued on October 22, 1999, Correction to Source Registration Permit No. 97-07-074
3. Construction Permit No. 01-03-007 Issued on June 4, 2001
4. Section 112(j) Part 1 Application for NESHAP Dated May 10, 2002
5. Precompliance Report for Pharmaceutical MACT Standard (Subpart GGG) Dated April 19, 2002
6. Notification of Compliance Status Report for MACT Subpart GGG Dated March 20, 2003
7. Permit No. 04-02-003 Issued on February 13, 2004 Replacing Permit No. 98-03-020
8. Source Registration Permit No. SR03.009 Issued on May 12, 2003
9. Source Registration Permit No. SR03.009 Issued on May 12, 2003

Broadway Installation

1. Amendment Permit No. 96-02-018A for the Manufacture of Medical Liquid and Powder Nutrients Issued on September 18, 1998
2. Source Registration Permit No. SR04.009 Issued On February 13, 2004 to Amend Source Registration Permit No. 01720

II. Plant Wide Emission Limitations

The installation shall comply with each of the following emission limitations. Consult the appropriate sections in the Code of Federal Regulations (CFR) and Code of State Regulations (CSR) for the full text of the applicable requirements.

None

III. Emission Unit Specific Emission Limitations

The installation shall comply with each of the following emission limitations. Consult the appropriate sections in the Code of Federal Regulations (CFR) and Code of State Regulations (CSR) for the full text of the applicable requirements.

EU0010-EU0020 Dekalb Installation - Natural Gas Fired Boilers			
EU ID	EQ Reference # (Year)	General Description	Manufacturer/Model #
EU0010	EP-1802 (2002)	10.4 MMBtu/hr Boiler (constructed 1956) Fuel: Natural Gas	Continental Boiler
EU0020	EP-1803 (2002)	10.4 MMBtu/hr Boiler (constructed 1981) Fuel: Natural Gas	Johnston Boiler

Permit Condition EU0010-001 through EU0020-001

10 CSR 10-5.030

Maximum Allowable Emissions of Particulate Matter from Fuel Burning Equipment Used for Indirect Heating

Emission Limitation:

- 1) The permittee shall not emit particulate matter in excess of 0.50 pounds per million Btu of heat input from EU0010.
- 2) The permittee shall not emit particulate matter in excess of 0.21 pounds per million Btu of heat input from EU0020.

Operational Limitation:

The emission units shall be limited to burning pipeline grade natural gas.

Monitoring/Record Keeping:

Documentation supporting the fuel used is natural gas. Fuel purchase receipts, analyzed samples or certifications that verify the fuel type will be acceptable.

Reporting:

The permittee shall submit fuel certification, and deviation or exceedance reports to the City of St. Louis Air Pollution Control Program, 1415 North Thirteenth Street, St. Louis, MO 63106 and to APCP Enforcement Section, P.O. Box 176, Jefferson City, MO 65102 semiannually.

Permit Condition EU0010-002 through EU0020-002

10 CSR 10-6.220

St. Louis City Ordinance No. 65645, § 14 ¹

Restriction of Emission of Visible Air Contaminants

Emission Limitation:

No person shall discharge into the atmosphere from any source of emission any air contaminant greater than 20% visible opacity for a period in excess of six (6) minutes in any consecutive sixty (60) minute period. Any emissions in excess of 40% opacity, regardless of time, are considered excessive emissions.

Monitoring/Record Keeping/Reporting

The affected emission units are inherently in compliance with the visible emission requirements since they only combust natural gas, therefore no ongoing monitoring, record keeping, or reporting is required."

¹ This rule is a local rule, which is enforceable by the St. Louis City only.

EU0030 Dekalb Installation - Paint Spray Booth			
EU ID	EIQ Reference # (Year)	General Description	Manufacturer/Model #
EU0030	EP-1501 (2002)	Paint Spray Booth (constructed in 1992)	Unavailable

Permit Condition EU0030-001

10 CSR 10-6.060

Construction Permits Required

Construction Permit – Permit Issued October 16, 1992

Emission Limitation:

- 1) VOC emissions from the paint spray booth shall not exceed 2.5 tons (actual) in any consecutive twelve (12) month period.
- 2) The usage of paint, thinner and cleaners shall be limited to 100 gallons per year, 50 gallons per year and 50 gallons in any consecutive twelve-(12) month period, respectively.
- 3) The paint spray booth shall be operated in accordance with the application as submitted, as well as per the manufacturer's instructions.

Monitoring/Record Keeping:

- 1) The permittee shall keep quarterly records that include the rolling 12 month VOC emissions on site to verify the VOC emission limit of 2.5 tons (actual) per year for the paint spray booths at the Dekalb installation. The quarterly records shall include the rolling 12-month VOC emissions. Attachment B or an equivalent sheet shall be used for keeping track of the VOC emissions from the painting operation.
- 2) The permittee shall also keep on site the following: (See Attachment B)
 - a) Records of actual operational hours of the paint booth.
 - b) Records of type and quantity of paint/solvent usage including cleaning solvent for the paint booth.

Reporting:

- 1) The permittee shall report to the City of St. Louis Air Pollution Control Program, 1415 North Thirteenth Street, St. Louis, MO 63106 and to APCP Enforcement Section, P.O. Box 176, Jefferson City, MO 65102 no later than ten days after the end of each month, if the records show that permittee exceeded the 12-month emissions, usage and operational hours limitations.
- 2) Reports of any deviations from monitoring, record keeping and reporting requirements of this permit condition shall be submitted semiannually.

EU0040 through EU0400

Dekalb Installation - General Equipment Throughout K Building and XP Coldroom

EU ID	EIQ Reference # (Year)	General Description	Manufacturer/Model #
EU0040	EP-1401 (2002)	50 Gallon Reactor with Condenser (constructed 1967), EQP No. 1RT-0013.	Pfaudler
EU0050		30 Gallon Catch Tank (constructed 1967), EQP No. 1RT-0013-T01	Laciny Brothers
EU0060		100 Gallon Reactor with Condenser (constructed 1967), EQP No. 1RT-0011	Pfaudler
EU0070		50 Gallon Catch Tank (constructed 1967), EQP No. 1RT-0011-T01	
EU0080		500 Gallon Reactor (constructed 1967) with Condenser, EQP No. 1RT-0015	Mueller
EU0090		200 Gallon Catch Tank (constructed 1967), EQP No. 1RT-0015-T01	
EU0100		1,200 Gallon Reactor with Condenser (constructed 1967), EQP No. 1RT-0012	
EU0110		500 Gallon Catch Tank (constructed 1983), EQP No. 1RT-0012-T01	Art Welding
EU0120		1500 Gallon Jacketed Crystallizer with Condenser (constructed 1985), EQP No. 1RT-0019.	5 Star Industrial Services
EU0130		10 Gallon Portable Glasslined Reactor (constructed 1967), EQP No. 1RT-0014	Pfaudler, Model No. P14-10-25
EU0140		30 Gallon Portable Glasslined Reactor (constructed 1967), EQP No. 1RT-0027	Pfaudler, Model No. P20-30-25
EU0150		Portable Stainless Steel Reactor	Expert Industrial
EU0160		500 Gallon Glass Lined Crystallizer (constructed 2002), EQP No. 1RT-0026. The typical process train consists of the crystallizer, a centrifuge, a funnel filter, a shelf dryer and a condenser.	
EU0170		500 Gallon Glass Lined Crystallizer (constructed 2002), EQP No. 1RT-0025. The typical process train consists of the crystallizer, a centrifuge, a funnel filter, a shelf dryer and a condenser.	
EU0180		Centrifuge (constructed 2003), EQP No. 1CF-0091	
EU0190		11,000 Gallon Filter Press, EQP No. 1PR-0015	Eimco Process Equipment, Model No. 42F-DB-100
EU0200		Neutsche Filter, EQP No. NF-1	
EU0210		2,000 Gallon Press Tank-North (constructed 1996), EQP No. 1RT-0032	
EU0220		2,000 Gallon Press Tank-South (constructed 1996), EQP No. 1RT-0033	
EU0230		2,000 Gallon Vessel-F (constructed 1996), EQP No. 1T-0305	Precision Stainless

EU0040 through EU0400 DeKalb Installation - General Equipment Throughout K Building and XP Coldroom			
EU ID	EQ Reference #(Year)	General Description	Manufacturer/Model #
EU0240		2,000 Gallon Press Tank, EQP No. 1T-0013	
EU0250		2,000 Gallon Press Tank, EQP No. 1T-0014	
EU0260		Filter Press, EQP No. 1PR-0017	
EU0270		Filter Press, EQP No. 1PR-0018	
EU0280		140 Gallon Process Holding Tank, EQP No. 1V-0012	
EU0290		Centrifuge, EQP No. 1CF-0077	Sharples, Model No. A-26
EU0300		Centrifuge, EQP No. 1CF-0079	Sharples, Model No. A-26
EU0310		Centrifuge, EQP No. 1CF-0080	Sharples, Model No. A-26
EU0320		Centrifuge, EQP No. 1CF-0082	Sharples, Model No. A-26
EU0330		Column, EQP No. 1COL-0012	Laciny Brothers
EU0340		Column, EQP No. 1COL-0013	Laciny Brothers
EU0350		150 Gallon Centrifuge (constructed 1967), EQP No. 1CF-0087	Sharples, Model No. AS-26
EU0360		150 Gallon Centrifuge (constructed 1967), EQP No. 1CF-0088	Sharples, Model No. AS-16
EU0370		160 Gallon Fractionation Process Tank (constructed 1967), EQP No. 1T-0357	
EU0380		25 Gallon Fractionation Process Tank (constructed 1967), EQP No. 1T-0358	
EU0390		400 Gallon Precipitation Tank-East (constructed 1967), EQP No. 1T-0039	
EU0400		400 Gallon Precipitation Tank-West (constructed 1967), EQP No. 1T-0040	

Permit Condition EU0040-001 through EU0400-001

10 CSR 10-5.540

Control of Emissions from Batch Process Operations

10 CSR 10-6.065(6)(B)3.I.

Operating Permits – Compliance Plan

Compliance Plan:

- 1) By June 15, 2004, Sigma-Aldrich shall complete the collection of data necessary to define each main process equipment train or equipment combinations and sub-listings of various products (or product families) manufactured during calendar year 2003 using such batch process trains or combinations. The review of process flow diagrams or similar information for individual production batches is a major component of this data collection. Sigma-Aldrich shall continue to collect batch production data continuously at least through the end of calendar year 2007 or until written approval is granted by Missouri Department of Natural Resources authorizing termination of batch production data collection.
- 2) By October 29, 2004, Sigma-Aldrich shall identify the general provision requirements (of 10 CSR 10-5.540) applicable to each batch process operation (train or equipment combinations) and develop a course of action to comply with those provisions no later than December 31, 2004. This requirement is predicated on the understanding that specific regulatory requirements for any individual batch process operation may change as additional data is collected through 2007, but general provisions for a particular process or other grouping will not substantially change.

- 3) Sigma-Aldrich shall demonstrate initial compliance with 10 CSR 10-5.540 by installing control devices and/or demonstrating the required control efficiency to comply with both the regulatory control requirements and the general provision requirements identified for each batch process operation (train or equipment combinations). Depending on the control equipment necessary and the facility modifications/construction that may be required, the installation timeframe for the control equipment may vary. As a result, Sigma-Aldrich shall install "Phase 1" control equipment by February 15, 2005 and "Phase 2" control equipment by March 31, 2006. As data collection, calculations and other determinations required by this compliance plan progress, Sigma-Aldrich shall continue to demonstrate compliance with 10 CSR 10-5.540. Information demonstrating compliance shall be submitted to the APCP with quarterly status report(s) coinciding with the particular activity. Phase 1 involves the installation of inexpensive/easily-installed control devices (i.e., temperature probes). Phase 2 involves the installation of expensive/complex control equipment that may have a cascading impact on existing controls and may involve Process Safety Management review. Additionally, the equipment must be evaluated, designed, and installed in consideration of other facility systems.
- 4) Quarterly status reports shall be submitted to MDNR APCP Enforcement Section within fifteen days following the end of each calendar quarter. Specifically, quarterly status reports are due April 15, July 15, October 15, and January 15 each calendar year, such that the data through the end of calendar year 2007 is collected and submitted. The quarterly status reports shall contain updates on progress of WAF/WAV calculations and control device evaluations, as necessary. At a minimum, actual WAF/WAV calculations shall be submitted as part of the status reports once a year.
- 5) Terms for termination of batch production data collection shall include identification and installation of emission control devices/systems to ensure compliance with the requirements of 10 CSR 10-5.540, specifically the appropriate control efficiency requirements in Section (3) of 10 CSR 10-5.540.
- 6) Affected batch process areas include but are not limited to: (1) Biological Buffers [T-West], (2) Hematology & Histology [XY-Building], (3) BioOrganics [BC-Building], (4) Natural Extractions [K-5, K-7, XP-Coldroom] – Production Groups 43 and 48, (5) Pharmaceutical Products [T-East].
- 7) Sigma-Aldrich shall quantify the production volumes of products produced via batch processes and using Volatile Organic Compounds (VOCs). As outlined in the quarterly status reports that began April 15, 2003, each affected batch process area shall be identified by (1) the annual number of production batches identified using VOCs, (2) a list of the VOCs used in batch processes, (3) a process flow diagram or similar schematic identifying each individual batch process train with a list of the products manufactured via each batch process train or equipment combination.
- 8) Sigma-Aldrich shall review equipment exhaust systems and determine equivalent flow rates for affected processes/production runs in the affected areas. For process trains where equivalent flow rates are not available, an alternate means of determining emissions shall be developed and proposed to MDNR APCP Enforcement for approval. Such alternate means may include mass balance calculations or other EPA-mandated emission calculations (i.e., Pharmaceuticals Production MACT).
- 9) For process trains where the equivalent flow rates are available, Sigma-Aldrich shall perform the Weighted Average Volatility (WAV) and Weighted Average Flow rate (WAF) calculations [per 10 CSR 10-5.540 (1)(E) and (3)(E)(2)] and make applicability determinations for each identified batch process train or equipment combination on an annual basis based on the trains or combinations identified to date.
- 10) Sigma-Aldrich shall amend its operating permit after applicability determinations are complete for affected process trains and/or after control devices are installed to demonstrate compliance (with 10 CSR 10-5.540) per the operating permit amendment requirements of 10 CSR 10-6.065, "Operating Permits". The permit amendment application(s) shall be submitted as soon as practicable but no later than 6 months after the applicability determination is made or the controls are installed.
- 11) If Sigma-Aldrich installs control device(s) to demonstrate compliance with the rule, the facility also must comply with the applicable control device monitoring, record keeping and reporting requirements of 10 CSR 10-5.540. Sigma-Aldrich may submit a request for the Missouri Department of Natural Resources to approval of alternate means, if necessary, to comply with the reporting, record keeping and/or monitoring requirements of 10 CSR 10-5.540.
- 12) No part of this Compliance Plan should be construed to supersede the requirement that in the event that other rules in Title 10 Division 10 of the Code of State Regulations are also applicable to specific batch process operations, the more stringent rule shall apply.
- 13) In the event Sigma-Aldrich fails to comply with its obligations under this plan, a breach of this plan shall have occurred and the Missouri Department of Natural Resources shall be entitled to pursue enforcement action.
- 14) Pending the discovery of circumstances that affect control selection, alternative installation deadlines may be necessary subject to MDNR approval.

- 15) Process trains will be prioritized such that those using small-scale chemistry (i.e., chemistry in glassware or other small containers involving less than a total of ten (10) gallons of VOC per batch process train) will be analyzed for applicability under 10 CSR 10-5.540 last. Upon request, MDNR may review and approve alternative plans for such small processes.

Permit Condition EU0160-002 through EU0170-002

10 CSR 10-6.060

Construction Permits Required

Source Registration Permit – Permit No. 01-11-035, Issued on January 29, 2002

Emission Limitation:

- 1) The permittee shall be limited to four (4) batches of β -Nicotinamide Adenine Dinucleotide (NAD), eight (8) batches of Adenosine Triphosphate (ATP), four (4) batches of High Performance Liquid Chromatography (HPLC) Sorbents per batch process train in any consecutive twelve (12) month period.
- 2) The permittee shall operate this process only if the condenser for the shelf dryer is in operation.

Monitoring:

To ensure proper functioning of the various equipment in the process train, the following shall be performed:

- 1) If leaks or abnormal conditions are detected, the appropriate measures for remediation shall be implemented within eight (8) hours.
- 2) All instruments and control equipment shall be calibrated, maintained and operated in accordance with manufacturer's specifications.

Record Keeping:

- 1) The permittee shall keep records of the number of batches for each product for each of the two-(2) crystallizer batch process trains for any consecutive twelve-(12) month period.
- 2) The permittee shall record any instances of exceedances of the permit limitations and conditions.
- 3) The permittee shall maintain a written record of any maintenance performed on the condensers.

Reporting:

- 1) The permittee shall notify the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 in writing of any changes made to the process, which would result in an increase in emissions from the permitted levels.
- 2) The permittee shall report any instances of exceedances of the permit limitations and conditions to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 5:00 PM on the following business day.

Permit Condition EU0180-002 through EU0270-002

10 CSR 10-6.060

Construction Permits Required

Source Registration Permit – Permit No. 02-12-027 (Issued on January 22, 2003)

Emission Limitation:

- 1) The permittee shall be limited to four-(4) alcohol dehydrogenase (ADH) producing batches in any consecutive twelve-(12) month period.
- 2) At all times the batch process train is in operation for producing ADH, the VOC concentration from the centrifuge shall not equal or exceed 500 parts per million by volume (ppmv) on a continuous basis.

Monitoring/Record Keeping:

- 1) The permittee shall keep monthly records of the number of ADH producing batches including a calculated total for every consecutive twelve-(12) month period.
- 2) The permittee shall monitor the VOC concentration from the centrifuge on a continuous basis and keep monthly records of verification that the vent stream concentration shall not equal or exceed five-hundred (500) ppmv.

Reporting:

- 1) The permittee shall notify the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 in writing if the vent stream concentration at any time equals or exceeds five hundred (500) ppmv, within sixty (60) days after such an event.
- 2) The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition, or any malfunction which causes any deviation from or an exceedance of this permit condition.

EU0410 through EU0610 Dekalb Installation - General Equipment Throughout BC Building			
EU ID	EQ Reference # (Year)	General Description	Manufacturer/Model #
EU0410	EP-1402 (2002)	1,000 Gallon Crystallizer (constructed 1975), EQP No. 1RT-0028	Pfaudler, Model No. R174-0886
EU0420		20 Gallon Reactor (constructed 1969), EQP No. 1RT-0001	Pfaudler, Model No. E169-0345
EU0430		30 Gallon Catch Tank (constructed 1967), EQP No. 1T-0002	Pfaudler, Model No. L10362
EU0440		50 Gallon Reactor (constructed 1984), EQP No. 1RT-0002	Pfaudler, Model No. E184-0364
EU0450		100 Gallon Reactor (constructed 1981), EQP No. 1RT-0003	Pfaudler, Model No. E181-0104
EU0460		100 Gallon Catch Tank (constructed 1977), EQP No. 1RT-0003-T42	Pfaudler, Model No. E177-3050
EU0470		500 Gallon Reactor (constructed 2001), EQP No. 1RT-0004	Pfaudler, Model No. R185-0049
EU0480		100 Gallon Catch Tank (constructed 1973), EQP No. 1RT-0004-T04	Pfaudler, Model No. E173-0008
EU0490		500 Gallon Reactor (2001), EQP No. 1RT-0005	Pfaudler, Serial No. J044854
EU0500		100 Gallon Catch Tank (constructed 1952), EQP No. 1RT-0005-T05	Pfaudler, Model No. E85176
EU0510		1000 Gallon Reactor (2001), EQP No. 1RT-0006	Pfaudler, Serial No. J044855
EU0520		300 Gallon Catch Tank (constructed 1974), EQP No. 1RT0006-T01	Pfaudler, Model No. E174-1283
EU0530		750 Gallon Receiver (constructed 1967), EQP No. 1V-0003	
		DYE LAB AREA	
EU0540		50 Gallon Reactor (constructed 1970), EQP No. 1RT-0008	Pfaudler, Model No. E169-2000
EU0550		50 Gallon Catch Tank (constructed 1967), EQP No. 1RT-0008-T01	Pfaudler
EU0560		50 Gallon Reactor (constructed 1978), EQP No. 1RT-0007	Pfaudler, Model No. E177-3031
EU0570		50 Gallon Catch Tank (constructed 1963), EQP No. 1RT-0007-T01	Pfaudler, Model No. E163-0933
EU0580		200 Gallon Reactor (constructed 1991), EQP No. 1RT-0030	Pfaudler, Model No. R191-0513
EU0590		100 Gallon Catch Tank (constructed 1981), EQP No. 1RT-0030-T01	Pfaudler, Model No. E181-0683
EU0600		100 Gallon Reactor (constructed 1963), EQP No. 1RT-0031	Pfaudler, Model No. E163-1307
EU0610		100 Gallon Catch Tank (constructed 1976), EQP No. 1RT-0031-T01	Pfaudler, Model No. E176-1460

Permit Condition EU0410-001 through EU0610-001

10 CSR 10-5.540

Control of Emissions from Batch Process Operations

10 CSR 10-6.065(6)(B)3.I.

Operating Permits – Compliance Plan

Compliance Plan:

- 1) By June 15, 2004, Sigma-Aldrich shall complete the collection of data necessary to define each main process equipment train or equipment combinations and sub-listings of various products (or product families) manufactured during calendar year 2003 using such batch process trains or combinations. The review of process flow diagrams or similar information for individual production batches is a major component of this data collection. Sigma-Aldrich shall continue to collect batch production data continuously at least through the end of calendar year 2007 or until written approval is granted by Missouri Department of Natural Resources authorizing termination of batch production data collection.
- 2) By October 29, 2004, Sigma-Aldrich shall identify the general provision requirements (of 10 CSR 10-5.540) applicable to each batch process operation (train or equipment combinations) and develop a course of action to comply with those provisions no later than December 31, 2004. This requirement is predicated on the understanding that specific regulatory requirements for any individual batch process operation may change as additional data is collected through 2007, but general provisions for a particular process or other grouping will not substantially change.
- 3) Sigma-Aldrich shall demonstrate initial compliance with 10 CSR 10-5.540 by installing control devices and/or demonstrating the required control efficiency to comply with both the regulatory control requirements and the general provision requirements identified for each batch process operation (train or equipment combinations). Depending on the control equipment necessary and the facility modifications/construction that may be required, the installation timeframe for the control equipment may vary. As a result, Sigma-Aldrich shall install "Phase 1" control equipment by February 15, 2005 and "Phase 2" control equipment by March 31, 2006. As data collection, calculations and other determinations required by this compliance plan progress, Sigma-Aldrich shall continue to demonstrate compliance with 10 CSR 10-5.540. Information demonstrating compliance shall be submitted to the APCP with quarterly status report(s) coinciding with the particular activity. Phase 1 involves the installation of inexpensive/easily-installed control devices (i.e., temperature probes). Phase 2 involves the installation of expensive/complex control equipment that may have a cascading impact on existing controls and may involve Process Safety Management review. Additionally, the equipment must be evaluated, designed, and installed in consideration of other facility systems.
- 4) Quarterly status reports shall be submitted to the Missouri Department of Natural Resources, APCP Enforcement Section within fifteen days following the end of each calendar quarter. Specifically, quarterly status reports are due April 15, July 15, October 15, and January 15 each calendar year, such that the data through the end of calendar year 2007 is collected and submitted. The quarterly status reports shall contain updates on progress of WAF/WAV calculations and control device evaluations, as necessary. At a minimum, actual WAF/WAV calculations shall be submitted as part of the status reports once a year.
- 5) Terms for termination of batch production data collection shall include identification and installation of emission control devices/systems to ensure compliance with the requirements of 10 CSR 10-5.540, specifically the appropriate control efficiency requirements in Section (3) of 10 CSR 10-5.540.
- 6) Affected batch process areas include but are not limited to: (1) Biological Buffers [T-West], (2) Hematology & Histology [XY-Building], (3) BioOrganics [BC-Building], (4) Natural Extractions [K-5, K-7, XP-Coldroom] – Production Groups 43 and 48, (5) Pharmaceutical Products [T-East].
- 7) Sigma-Aldrich shall quantify the production volumes of products produced via batch processes and using Volatile Organic Compounds (VOCs). As outlined in the quarterly status reports that began April 15, 2003, each affected batch process area shall be identified by (1) the annual number of production batches identified using VOCs, (2) a list of the VOCs used in batch processes, (3) a process flow diagram or similar schematic identifying each individual batch process train with a list of the products manufactured via each batch process train or equipment combination.
- 8) Sigma-Aldrich shall review equipment exhaust systems and determine equivalent flow rates for affected processes/production runs in the affected areas. For process trains where equivalent flow rates are not available, an alternate means of determining emissions shall be developed and proposed to MDNR APCP Enforcement for approval. Such alternate means may include mass balance calculations or other EPA-mandated emission calculations (i.e., Pharmaceuticals Production MACT).

- 9) For process trains where the equivalent flow rates are available, Sigma-Aldrich shall perform the Weighted Average Volatility (WAV) and Weighted Average Flow rate (WAF) calculations [per 10 CSR 10-5.540 (1)(E) and (3)(E)(2)] and make applicability determinations for each identified batch process train or equipment combination on an annual basis based on the trains or combinations identified to date.
- 10) Sigma-Aldrich shall amend its operating permit after applicability determinations are complete for affected process trains and/or after control devices are installed to demonstrate compliance (with 10 CSR 10-5.540) per the operating permit amendment requirements of 10 CSR 10-6.065, "Operating Permits". The permit amendment application(s) shall be submitted as soon as practicable but no later than 6 months after the applicability determination is made or the controls are installed.
- 11) If Sigma-Aldrich installs control device(s) to demonstrate compliance with the rule, the facility also must comply with the applicable control device monitoring, record keeping and reporting requirements of 10 CSR 10-5.540. Sigma-Aldrich may submit a request for MDNR to approval of alternate means, if necessary, to comply with the reporting, record keeping and/or monitoring requirements of 10 CSR 10-5.540.
- 12) No part of this Compliance Plan should be construed to supersede the requirement that in the event that other rules in Title 10 Division 10 of the Code of State Regulations are also applicable to specific batch process operations, the more stringent rule shall apply.
- 13) In the event Sigma-Aldrich fails to comply with its obligations under this plan, a breach of this plan shall have occurred and the MDNR shall be entitled to pursue enforcement action.
- 14) Pending the discovery of circumstances that affect control selection, alternative installation deadlines may be necessary subject to MDNR approval.
- 15) Process trains will be prioritized such that those using small-scale chemistry (i.e., chemistry in glassware or other small containers involving less than a total of ten (10) gallons of VOC per batch process train) will be analyzed for applicability under 10 CSR 10-5.540 last. Upon request, MDNR may review and approve alternative plans for such small processes.

EU0620 through EU0640			
Dekalb Installation - Raw Material Storage Tanks and Drum Storage Area			
EU ID	EIQ Reference # (Year)	General Description	Manufacturer/ Model #
EU0620	EP-1908	12,000 Gallon Denatured Alcohol Storage Tank (constructed 1999), EQP No. T-400	
EU0630	EP-1909	12,000 Gallon Methanol Storage Tank (constructed 1999), EQP No. T-402	
EU0640	Unassigned	Fifty Five (55) Gallon Drums Storage Area	

Permit Condition EU0620-001 through EU0640-001
10 CSR 10-6.060 Construction Permits Required Construction Permit No. 99-10-071 (Issued on December 7, 1999)

Emission Limitation:

- 1) The permittee shall not emit greater than 0.8 tons of VOCs and 0.40 tons of HAPs from EU0620 in any consecutive twelve (12) month period.
- 2) The permittee shall not emit greater than 1.03 tons of VOCs and HAPs from EU0630 in any consecutive twelve (12) month period.
- 3) The permittee shall ensure that the throughputs of denatured alcohol and methanol for EU0620 and EU0630 respectively, will not exceed 6,240,000 gallons each in any consecutive twelve (12) month period.
- 4) EU0620 and EU0630 shall be equipped with a pressure/vacuum conservation vent set at 0.03 pounds per square inch (psi) or greater, or an equally effective control device approved by the St. Louis City Air Pollution Control Program.

Monitoring:

- 1) The permittee shall follow the manufacturers recommended maintenance and operating procedures for the emission units.
- 2) A physical inspection of loading and unloading equipment shall be conducted daily during operations.

Record Keeping:

- 1) The permittee shall keep monthly and rolling 12-month records of denatured alcohol and methanol used. The monthly throughput data shall be totaled for each consecutive twelve (12) month period. Monthly emissions of VOC and hazardous air pollutants (HAP) shall be calculated and recorded.
- 2) A current record of product storage shall be kept at the facility and shall be made available to the Division upon request.
- 3) The permittee shall keep maintenance records for the equipment. The permittee shall also keep a record of any spills or leaks of more than a reportable quantity, including all reporting and corrective actions taken.

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition, or any malfunction which causes any deviation from or an exceedance of this permit condition.

EU0650 through EU0660
Cherokee Installation - Natural Gas Fired Boilers

EU ID	EIQ Reference # (Year)	General Description	Manufacturer/Model #
EU0650	EP-3801 (2002)	12.55 MMBtu/hr Boiler (constructed 1985) Fuel: Natural Gas	Cleaver Brooks Boiler, Model No. CB300
EU0660	EP-3802 (2002)	12.55 MMBtu/hr Boiler (constructed 1985) Fuel: Natural Gas	Cleaver Brooks Boiler, Model No. CB300

Permit Condition EU0650-001 through EU0660-001

10 CSR 10-5.030

Maximum Allowable Emissions of Particulate Matter from Fuel Burning Equipment Used for Indirect Heating

Emission Limitation:

The permittee shall not emit particulate matter in excess of 0.21 pounds per million Btu of heat input from each of the emission units EU0650 and EU0660.

Operational Limitation:

The emission units shall be limited to burning pipeline grade natural gas.

Monitoring/Record Keeping:

Documentation supporting the fuel used is natural gas. Fuel purchase receipts, analyzed samples or certifications that verify the fuel type will be acceptable.

Reporting:

The permittee shall submit fuel certification, and deviation or exceedance reports to the City of St. Louis Air Pollution Control Program, 1415 North Thirteenth Street, St. Louis, MO 63106 and to APCP Enforcement Section, P.O. Box 176, Jefferson City, MO 65102 semiannually.

Permit Condition EU0650-002 through EU0660-002

10 CSR 10-6.220

St. Louis City Ordinance No. 65645, Section 14²

Restriction of Emission of Visible Air Contaminants

Emission Limitation:

No person shall discharge into the atmosphere from any source of emission any air contaminant greater than 20% visible opacity for a period in excess of six (6) minutes in any consecutive sixty (60) minute period. Any emissions in excess of 40% opacity, regardless of time, are considered excessive emissions.

Monitoring/Record Keeping/Reporting/Reporting:

The affected emission units are inherently in compliance with the visible emission requirements since they only combust natural gas, therefore no ongoing monitoring, record keeping, or reporting is required

² This rule is a local rule, which is enforceable by the St. Louis City only.

EU0670 Cherokee Installation - Natural Gas Fired Boiler			
EU ID	EQ Reference # (Year)	General Description	Manufacturer/Model #
EU0670	EP-3803 (2002)	12.55 MMBtu/hr Boiler (constructed 1998) Fuel: Natural Gas	Cleaver Brooks Boiler, Model No. CB700-300-150

Permit Condition EU0670-001

10 CSR 10-6.060

Construction Permits Required

Permit No. 04-02-003 (Replaces Permit No. 98-03-020) – Permit Issued February 13, 2004

10 CSR 10-6.070

New Source Performance Regulations

40 CFR Part 60 Subpart Dc

Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

Emission Limitation:

The permittee shall only use pipeline grade natural gas as a source of fuel for this boiler.

[Permit No. 04-02-003, Section IIA.]

Monitoring/Record Keeping:

The permittee shall record and maintain records of the amount of fuel combusted during each month.

[EPA Region VII Letter of Approval of Reduced Record Keeping Frequency, Dated April 29, 1998]

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition.

[Permit No. 04-02-003, Section IVC]

EU0680 Cherokee Installation - Paint Spray Booth			
EU ID	EQ Reference # (Year)	General Description	Manufacturer/Model #
EU0680	EP-3501 (2002)	Paint Spray Booth (constructed in 1992)	Unavailable

Permit Condition EU0680-001

10 CSR 10-6.060

Construction Permits Required

Source Registration Permit – Permit Issued October 16, 1992

Emission Limitation:

- 1) VOC emissions from the paint spray booth shall not exceed 2.5 tons (actual) in any consecutive twelve (12) month period.
- 2) The paint spray booth shall be operated in accordance with the permit application as submitted, as well as per the manufacturer's instructions.
- 3) The usage of paint, thinner and cleaners shall be limited to 100 gallons per year, 50 gallons per year and 50 gallons per year, respectively.

Record Keeping:

- 1) The permittee shall keep quarterly records on site to verify the VOC emission limit of 2.5 tons (actual) per year for the paint spray booth Cherokee installation. The quarterly records shall include the rolling 12 month VOC emissions. Attachment B or an equivalent sheet shall be used for keeping track of the VOC emissions from the painting operations.
- 2) The permittee shall also keep on site the following: (See Attachment B)
 - a) Records of actual operational hours of the paint booth.
 - b) Records of type and quantity of paint/solvent usage including cleaning solvent for the paint booth.

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this regulation, or any malfunction which causes any deviation from or an exceedance of this regulation.

EU0681 Cherokee Installation - Grinder			
EU ID	EIQ Reference # (Year)	General Description	Manufacturer/Model #
EU0690	EP-402 (2004)	Grinder -- batch process with a maximum throughput of 2 kg/min corn kernels	Unavailable

Permit Condition EU0681-001

10 CSR 10-6.060

Construction Permits Required

Source Registration Permit No. SR03.009 - Permit Issued May 12, 2003

Emission Limitation:

- 1) The permittee shall not emit more than 0.34 tons of PM₁₀ during any consecutive 12-month period.
- 2) Visible opacity from the grinder shall be limited to less than 20%.

Monitoring/Record Keeping:

- 1) The permittee shall keep records of PM₁₀ emissions monthly, including a calculated total for any consecutive 12-month period of time.
- 2) The permittee shall record any exceedance of this permit condition and report to the agency within 10 days.
- 3) The permittee shall maintain all records for a minimum of 5 years.

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition, or any malfunction which causes any deviation from or an exceedance of this permit condition.

EU0690 through EU0740 Cherokee Installation - General Equipment Throughout XY Building			
EU ID	EIQ Reference # (Year)	General Description	Manufacturer/Model #
EU0690	EP-3401 (2002)	6,000 Liter A-Vessel (constructed 1987), 3RT-0127	Paul Mueller Company
EU0700		12,000 Liter B-Vessel (constructed 1987), 3RT-0126	Alpha Tank Company
EU0710		3,000 Liter C-Vessel (constructed 1987), 3RT-0128	
EU0720		Dye Mix Batch Operation (constructed 1987)	
EU0730		Filling Equipment Lines 1 and 2 (constructed 1987)	
EU0740		Powder Weigh and Repackaging Operation (constructed 1987)	

Permit Condition EU0690-001 through EU0740-001

10 CSR 10-5.540

Control of Emissions from Batch Process Operations

10 CSR 10-6.065(6)(B)3.I.

Operating Permits – Compliance Plan

Compliance Plan:

- 1) By June 15, 2004, Sigma-Aldrich shall complete the collection of data necessary to define each main process equipment train or equipment combinations and sub-listings of various products (or product families) manufactured during calendar year 2003 using such batch process trains or combinations. The review of process flow diagrams or similar information for individual production batches is a major component of this data collection. Sigma-Aldrich shall continue to collect batch production data continuously at least through the end of calendar year 2007 or until written approval is granted by Missouri Department of Natural Resources authorizing termination of batch production data collection.
- 2) By October 29, 2004, Sigma-Aldrich shall identify the general provision requirements (of 10 CSR 10-5.540) applicable to each batch process operation (train or equipment combinations) and develop a course of action to comply with those provisions no later than December 31, 2004. This requirement is predicated on the understanding that specific regulatory requirements for any individual batch process operation may change as additional data is collected through 2007, but general provisions for a particular process or other grouping will not substantially change.
- 3) Sigma-Aldrich shall demonstrate initial compliance with 10 CSR 10-5.540 by installing control devices and/or demonstrating the required control efficiency to comply with both the regulatory control requirements and the general provision requirements identified for each batch process operation (train or equipment combinations). Depending on the control equipment necessary and the facility modifications/construction that may be required, the installation timeframe for the control equipment may vary. As a result, Sigma-Aldrich shall install "Phase 1" control equipment by February 15, 2005 and "Phase 2" control equipment by March 31, 2006. As data collection, calculations and other determinations required by this compliance plan progress, Sigma-Aldrich shall continue to demonstrate compliance with 10 CSR 10-5.540. Information demonstrating compliance shall be submitted to the APCP with quarterly status report(s) coinciding with the particular activity. Phase 1 involves the installation of inexpensive/easily-installed control devices (i.e., temperature probes). Phase 2 involves the installation of expensive/complex control equipment that may have a cascading impact on existing controls and may involve Process Safety Management review. Additionally, the equipment must be evaluated, designed, and installed in consideration of other facility systems.
- 4) Quarterly status reports shall be submitted to MDNR APCP Enforcement Section within fifteen days following the end of each calendar quarter. Specifically, quarterly status reports are due April 15, July 15, October 15, and January 15 each calendar year, such that the data through the end of calendar year 2007 is collected and submitted. The

- quarterly status reports shall contain updates on progress of WAF/WAV calculations and control device evaluations, as necessary. At a minimum, actual WAF/WAV calculations shall be submitted as part of the status reports once a year.
- 5) Terms for termination of batch production data collection shall include identification and installation of emission control devices/systems to ensure compliance with the requirements of 10 CSR 10-5.540, specifically the appropriate control efficiency requirements in Section (3) of 10 CSR 10-5.540.
 - 6) Affected batch process areas include but are not limited to: (1) Biological Buffers [T-West], (2) Hematology & Histology [XY-Building], (3) BioOrganics [BC-Building], (4) Natural Extractions [K-5, K-7, XP-Coldroom] – Production Groups 43 and 48, (5) Pharmaceutical Products [T-East].
 - 7) Sigma-Aldrich shall quantify the production volumes of products produced via batch processes and using Volatile Organic Compounds (VOCs). As outlined in the quarterly status reports that began April 15, 2003, each affected batch process area shall be identified by (1) the annual number of production batches identified using VOCs, (2) a list of the VOCs used in batch processes, (3) a process flow diagram or similar schematic identifying each individual batch process train with a list of the products manufactured via each batch process train or equipment combination.
 - 8) Sigma-Aldrich shall review equipment exhaust systems and determine equivalent flow rates for affected processes/production runs in the affected areas. For process trains where equivalent flow rates are not available, an alternate means of determining emissions shall be developed and proposed to MDNR APCP Enforcement for approval. Such alternate means may include mass balance calculations or other EPA-mandated emission calculations (i.e., Pharmaceuticals Production MACT).
 - 9) For process trains where the equivalent flow rates are available, Sigma-Aldrich shall perform the Weighted Average Volatility (WAV) and Weighted Average Flow rate (WAF) calculations [per 10 CSR 10-5.540 (1)(E) and (3)(E)(2)] and make applicability determinations for each identified batch process train or equipment combination on an annual basis based on the trains or combinations identified to date.
 - 10) Sigma-Aldrich shall amend its operating permit after applicability determinations are complete for affected process trains and/or after control devices are installed to demonstrate compliance (with 10 CSR 10-5.540) per the operating permit amendment requirements of 10 CSR 10-6.065, "Operating Permits". The permit amendment application(s) shall be submitted as soon as practicable but no later than 6 months after the applicability determination is made or the controls are installed.
 - 11) If Sigma-Aldrich installs control device(s) to demonstrate compliance with the rule, the facility also must comply with the applicable control device monitoring, record keeping and reporting requirements of 10 CSR 10-5.540. Sigma-Aldrich may submit a request for the Missouri Department of Natural Resources to approval of alternate means, if necessary, to comply with the reporting, record keeping and/or monitoring requirements of 10 CSR 10-5.540.
 - 12) No part of this Compliance Plan should be construed to supersede the requirement that in the event that other rules in Title 10 Division 10 of the Code of State Regulations are also applicable to specific batch process operations, the more stringent rule shall apply.
 - 13) In the event Sigma-Aldrich fails to comply with its obligations under this plan, a breach of this plan shall have occurred and the Missouri Department of Natural Resources shall be entitled to pursue enforcement action.
 - 14) Pending the discovery of circumstances that affect control selection, alternative installation deadlines may be necessary subject to MDNR approval.
 - 15) Process trains will be prioritized such that those using small-scale chemistry (i.e., chemistry in glassware or other small containers involving less than a total of ten (10) gallons of VOC per batch process train) will be analyzed for applicability under 10 CSR 10-5.540 last. Upon request, MDNR may review and approve alternative plans for such small processes.

EU0750 through EU0940 Cherokee Installation - General Equipment Throughout T Building (West)			
EU ID	EQ Referen ce # (Year)	General Description	Manufacturer/Model #
EU0750	EP-3402 (2002)	750 Gallon Reactor (constructed 1987), EQP No. 3RT-0001	Pfaudler, Model No. R183-0120
EU0760		350 Gallon Catch Tank (constructed 1987), 3RT-0001-T26	Pfaudler, Model No. E158-0225
EU0770		1,000 Gallon Reactor (constructed 1987), 3RT-0002	Pfaudler, Model No. R181-0192
EU0780		350 Gallon Catch Tank (constructed 1987), 3RT-0002-T27	Pfaudler, Model No. E160-0040
EU0790		2,000 Gallon Reactor (constructed 1987), EQP No. 3RT-0004	Pfaudler, Model No. SA-2000
EU0800		1,000 Gallon Catch Tank (constructed 1987), EQP No. 3RT-0004-T29	Pfaudler, Model No. R679-8036
EU0810		20 Gallon Reactor (constructed 1987), EQP No. 3RT-0071	Pfaudler, Model No. E95565
EU0820		10 Gallon Catch Tank (constructed 1977), EQP No. 3RT-0071-T72	Pfaudler, Model No. E179-0847
EU0830		50 Gallon Reactor (constructed 1987), EQP No. 3RT-0008	Pfaudler
EU0840		50 Gallon Catch Tank (constructed 1987), EQP No. 3RT-0008-T09	Pfaudler, Model No. E278-0873
EU0850		1,500 Gallon Crystallizer (constructed 1984), EQP No. 3RT-0003	Art Welding Company, Model No. 3013
EU0860		1,800 Gallon Crystallizer (constructed 1984), EQP No. 3RT-0010	
EU0870		1,000 Gallon Slurry Tank (constructed 1984), EQP No. 3T-0006	Pfaudler
EU0880		4,000 Gallon Sodium Vinyl Sulfonate Tank 1 (constructed 1998), EQP No. 3T-0152	
EU0890		2,000 Gallon Sodium Vinyl Sulfonate Tank 2 (constructed 1998), EQP No. 3T-0153	
EU0900		2,000 Gallon Sodium Vinyl Sulfonate Tank 3 (constructed 1998), EQP No. 3T-0154	
		BUFFER LINE REACTOR SYSTEM	
EU0910		5,000 Gallon Reactor (EQP No. 3RT-0010) with a 1,000 Gallon Receiver (both constructed 2001) (EQP No. 3RT-0010-V01), Permit 01-03-007	Pfaudler, Model No. RA-5000 & Pfaudler, Model No. RA 60-1000
EU0920		1,000 Gallon Catch Tank/Receiver (constructed 1987), EQP No. 3RT-0005-T30	Pfaudler, Model No. S177-4134
EU0930		3,000 Gallon Crystallizer (constructed 1987) (EQP No. 3RT-0005)	Pfaudler, Model No. R179-0497
EU0940		117 Gallon Centrifuge (constructed 2001) (EQP No. 3CF-0003), Permit 01-03-007	Western State, Model No. Q-320

Permit Condition EU0750-001 through EU0940-001

10 CSR 10-5.540

Control of Emissions from Batch Process Operations

10 CSR 10-6.065(6)(B)3.I.

Operating Permits – Compliance Plan

Compliance Plan:

- 1) By June 15, 2004, Sigma-Aldrich shall complete the collection of data necessary to define each main process equipment train or equipment combinations and sub-listings of various products (or product families) manufactured during calendar year 2003 using such batch process trains or combinations. The review of process flow diagrams or similar information for individual production batches is a major component of this data collection. Sigma-Aldrich shall continue to collect batch production data continuously at least through the end of calendar year 2007 or until written approval is granted by Missouri Department of Natural Resources authorizing termination of batch production data collection.
- 2) By October 29, 2004, Sigma-Aldrich shall identify the general provision requirements (of 10 CSR 10-5.540) applicable to each batch process operation (train or equipment combinations) and develop a course of action to comply with those provisions no later than December 31, 2004. This requirement is predicated on the understanding that specific regulatory requirements for any individual batch process operation may change as additional data is collected through 2007, but general provisions for a particular process or other grouping will not substantially change.
- 3) Sigma-Aldrich shall demonstrate initial compliance with 10 CSR 10-5.540 by installing control devices and/or demonstrating the required control efficiency to comply with both the regulatory control requirements and the general provision requirements identified for each batch process operation (train or equipment combinations). Depending on the control equipment necessary and the facility modifications/construction that may be required, the installation timeframe for the control equipment may vary. As a result, Sigma-Aldrich shall install "Phase 1" control equipment by February 15, 2005 and "Phase 2" control equipment by March 31, 2006. As data collection, calculations and other determinations required by this compliance plan progress, Sigma-Aldrich shall continue to demonstrate compliance with 10 CSR 10-5.540. Information demonstrating compliance shall be submitted to the APCP with quarterly status report(s) coinciding with the particular activity. Phase 1 involves the installation of inexpensive/easily-installed control devices (i.e., temperature probes). Phase 2 involves the installation of expensive/complex control equipment that may have a cascading impact on existing controls and may involve Process Safety Management review. Additionally, the equipment must be evaluated, designed, and installed in consideration of other facility systems.
- 4) Quarterly status reports shall be submitted to MDNR APCP Enforcement Section within fifteen days following the end of each calendar quarter. Specifically, quarterly status reports are due April 15, July 15, October 15, and January 15 each calendar year, such that the data through the end of calendar year 2007 is collected and submitted. The quarterly status reports shall contain updates on progress of WAF/WAV calculations and control device evaluations, as necessary. At a minimum, actual WAF/WAV calculations shall be submitted as part of the status reports once a year.
- 5) Terms for termination of batch production data collection shall include identification and installation of emission control devices/systems to ensure compliance with the requirements of 10 CSR 10-5.540, specifically the appropriate control efficiency requirements in Section (3) of 10 CSR 10-5.540.
- 6) Affected batch process areas include but are not limited to: (1) Biological Buffers [T-West], (2) Hematology & Histology [XY-Building], (3) BioOrganics [BC-Building], (4) Natural Extractions [K-5, K-7, XP-Coldroom] – Production Groups 43 and 48, (5) Pharmaceutical Products [T-East].
- 7) Sigma-Aldrich shall quantify the production volumes of products produced via batch processes and using Volatile Organic Compounds (VOCs). As outlined in the quarterly status reports that began April 15, 2003, each affected batch process area shall be identified by (1) the annual number of production batches identified using VOCs, (2) a list of the VOCs used in batch processes, (3) a process flow diagram or similar schematic identifying each individual batch process train with a list of the products manufactured via each batch process train or equipment combination.
- 8) Sigma-Aldrich shall review equipment exhaust systems and determine equivalent flow rates for affected processes/production runs in the affected areas. For process trains where equivalent flow rates are not available, an alternate means of determining emissions shall be developed and proposed to MDNR APCP Enforcement for approval. Such alternate means may include mass balance calculations or other EPA-mandated emission calculations (i.e., Pharmaceuticals Production MACT).

- 9) For process trains where the equivalent flow rates are available, Sigma-Aldrich shall perform the Weighted Average Volatility (WAV) and Weighted Average Flow rate (WAF) calculations [per 10 CSR 10-5.540 (1)(E) and (3)(E)(2)] and make applicability determinations for each identified batch process train or equipment combination on an annual basis based on the trains or combinations identified to date.
- 10) Sigma-Aldrich shall amend its operating permit after applicability determinations are complete for affected process trains and/or after control devices are installed to demonstrate compliance (with 10 CSR 10-5.540) per the operating permit amendment requirements of 10 CSR 10-6.065, "Operating Permits". The permit amendment application(s) shall be submitted as soon as practicable but no later than 6 months after the applicability determination is made or the controls are installed.
- 11) If Sigma-Aldrich installs control device(s) to demonstrate compliance with the rule, the facility also must comply with the applicable control device monitoring, record keeping and reporting requirements of 10 CSR 10-5.540. Sigma-Aldrich may submit a request for MDNR to approval of alternate means, if necessary, to comply with the reporting, record keeping and/or monitoring requirements of 10 CSR 10-5.540.
- 12) No part of this Compliance Plan should be construed to supersede the requirement that in the event that other rules in Title 10 Division 10 of the Code of State Regulations are also applicable to specific batch process operations, the more stringent rule shall apply.
- 13) In the event Sigma-Aldrich fails to comply with its obligations under this plan, a breach of this plan shall have occurred and the Missouri Department of Natural Resources shall be entitled to pursue enforcement action.
- 14) Pending the discovery of circumstances that affect control selection, alternative installation deadlines may be necessary subject to MDNR approval.
- 15) Process trains will be prioritized such that those using small-scale chemistry (i.e., chemistry in glassware or other small containers involving less than a total of ten (10) gallons of VOC per batch process train) will be analyzed for applicability under 10 CSR 10-5.540 last. Upon request, MDNR may review and approve alternative plans for such small processes.

Permit Condition EU0910-002 through EU0940-002

10 CSR 10-6.060

Construction Permits Required

Construction Permit No. 01-03-007 (Issued on June 4, 2001)

Emission Limitation:

- 1) The batch process shall not operate for more than 6,570 hours for the production of 3-(morpholino) propanesulfonic acid (MOPS) or 6,570 hours for the production of N-[Tris(hydroxymethyl)]-3-aminopropanesulfonic acid (TAPS) in any consecutive twelve-month period.
- 2) The permittee shall not emit greater than 16.36 tons of VOCs and 9.42 tons of methanol in any consecutive twelve (12) month period.

Monitoring:

- 1) The permittee shall ensure that at all times this batch operation takes place, the condenser for the rotary dryer is in operation.
- 2) The permittee shall perform the following to ensure proper functioning of the equipment:
 - a) If leaks or abnormal conditions are detected, the appropriate measures for remediation shall be implemented within eight (8) hours.
 - b) All instruments and control equipment shall be calibrated, maintained and operated according to manufacturer's specifications.

Record Keeping:

- 1) The permittee shall keep monthly records of each product produced on a monthly basis.
- 2) The permittee shall keep monthly records of the hour of operation and the amount of VOCs and methanol emitted to demonstrate compliance with emission limits 1 and 2 respectively.
- 3) The permittee shall keep maintenance records for the condenser.

Reporting:

- 1) The permittee shall report to the St. Louis City Air Pollution Control Program the next business day any malfunction or upset conditions that cause the operation of the rotary dryer without the condenser.
- 2) The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition.

EU0950 through EU1131 Cherokee Installation - General Equipment Throughout T Building (East)			
EU ID	EQ Reference # (Year)	General Description	Manufacturer/Model #
EU0950	EP-3403 (2002)	100 Gallon Reactor (constructed 1997), EQP No. 3RT-1000	Pfaudler, Model No. RTC32-100-100-100
EU0960		50 Gallon Receiver (constructed 1997), EQP No. 3RT-1000-T01	Pfaudler, Model No. JVRC24-50-70-100
EU0970		200 Gallon Reactor (constructed 1997), EQP No. 3RT-2000	Pfaudler, Model No. RT40-200-70-100
EU0980		100 Gallon Receiver (constructed 1994), EQP No. 3RT-2000-T01	Pfaudler, Model No. EC32-100-100-90
EU0990		750 Gallon Reactor (constructed 1997), EQP No. 3RT-7500	Pfaudler, Model No. KC60-750-70-100
EU1000		300 Gallon Receiver (constructed 1997), EQP No. 3RT-7500-T01	Pfaudler, Model No. KC48-300-70-100
EU1010		3,000 Gallon Crystallizer (constructed 1997), EQP No. 3RT-3000	Pfaudler, Model No. KC96-3000-70-100
EU1020		50 Gallon Receiver (constructed 1997), EQP No. 3RT-3000-T01	Pfaudler, Model No. P607-25
EU1030		800 kg Wet Cake Filter Dryer (constructed 1997), EQP No. 3FI-0046	Rosenmund, Model No. ML2000
EU1040		500 Gallon Receiver (2001), EQP No. 3FI-0046-T02	Precision Stainless, Model No. 6135-1, Serial No. 211083
EU1050		Shelf Dryer (constructed 1993), EQP No. 3D-0020	Laciny Brothers, Custom Built
EU1060		Contained Filter (constructed 1997), EQP No. 3FI-0047	Zwag, Custom Built
EU1070		100 Gallon Receiver (constructed 1998), EQP No. 3FI-0047-T01	Precision Stainless Model No. 6135-2
EU1080		50 Liter Scale Reactor System (constructed 1997), EQP No. 3RT-0500	Schott Process Systems, Model No. REAZ55/CTJ 13
EU1090		20 Liter Receiver (constructed 1997), EQP No. 3RT-0500-T02	Schott Process Systems, Model No. REAZ55/CTJ 13
EU1100		50 Gallon Solution Addition Tank (constructed 1997), EQP No. 3T-0121	Pfaudler, Model No. VRC24-50-10
EU1110		200 Gallon Carbon Tank (constructed 1997), EQP No. 3T-0116)	Pfaudler, Model No. RT40-200-70-100
EU1120		Closed Loop 250° F Glycol System (constructed 1997), EQP No. 3HTS-0001	Atlas Industrial, Model No. 10-144
EU1130		Low Temperature Coolant System (constructed 1997), EQP No. 3HTS-0002	Grasso, Model No. RC 2112
EU01131		45 Gallon Portable Nutsche Filter	

Permit Condition EU0950-001 through EU1131-001

10 CSR 10-5.540

Control of Emissions from Batch Process Operations

10 CSR 10-6.065(6)(B)3.I.

Operating Permits – Compliance Plan

Compliance Plan:

- 1) By June 15, 2004, Sigma-Aldrich shall complete the collection of data necessary to define each main process equipment train or equipment combinations and sub-listings of various products (or product families) manufactured during calendar year 2003 using such batch process trains or combinations. The review of process flow diagrams or similar information for individual production batches is a major component of this data collection. Sigma-Aldrich shall continue to collect batch production data continuously at least through the end of calendar year 2007 or until written approval is granted by Missouri Department of Natural Resources authorizing termination of batch production data collection.
- 2) By October 29, 2004, Sigma-Aldrich shall identify the general provision requirements (of 10 CSR 10-5.540) applicable to each batch process operation (train or equipment combinations) and develop a course of action to comply with those provisions no later than December 31, 2004. This requirement is predicated on the understanding that specific regulatory requirements for any individual batch process operation may change as additional data is collected through 2007, but general provisions for a particular process or other grouping will not substantially change.
- 3) Sigma-Aldrich shall demonstrate initial compliance with 10 CSR 10-5.540 by installing control devices and/or demonstrating the required control efficiency to comply with both the regulatory control requirements and the general provision requirements identified for each batch process operation (train or equipment combinations). Depending on the control equipment necessary and the facility modifications/construction that may be required, the installation timeframe for the control equipment may vary. As a result, Sigma-Aldrich shall install "Phase 1" control equipment by February 15, 2005 and "Phase 2" control equipment by March 31, 2006. As data collection, calculations and other determinations required by this compliance plan progress, Sigma-Aldrich shall continue to demonstrate compliance with 10 CSR 10-5.540. Information demonstrating compliance shall be submitted to the APCP with quarterly status report(s) coinciding with the particular activity. Phase 1 involves the installation of inexpensive/easily-installed control devices (i.e., temperature probes). Phase 2 involves the installation of expensive/complex control equipment that may have a cascading impact on existing controls and may involve Process Safety Management review. Additionally, the equipment must be evaluated, designed, and installed in consideration of other facility systems.
- 4) Quarterly status reports shall be submitted to the Missouri Department of Natural Resources APCP Enforcement Section within fifteen days following the end of each calendar quarter. Specifically, quarterly status reports are due April 15, July 15, October 15, and January 15 each calendar year, such that the data through the end of calendar year 2007 is collected and submitted. The quarterly status reports shall contain updates on progress of WAF/WAV calculations and control device evaluations, as necessary. At a minimum, actual WAF/WAV calculations shall be submitted as part of the status reports once a year.
- 5) Terms for termination of batch production data collection shall include identification and installation of emission control devices/systems to ensure compliance with the requirements of 10 CSR 10-5.540, specifically the appropriate control efficiency requirements in Section (3) of 10 CSR 10-5.540.
- 6) Affected batch process areas include but are not limited to: (1) Biological Buffers [T-West], (2) Hematology & Histology [XY-Building], (3) BioOrganics [BC-Building], (4) Natural Extractions [K-5, K-7, XP-Coldroom] – Production Groups 43 and 48, (5) Pharmaceutical Products [T-East].
- 7) Sigma-Aldrich shall quantify the production volumes of products produced via batch processes and using Volatile Organic Compounds (VOCs). As outlined in the quarterly status reports that began April 15, 2003, each affected batch process area shall be identified by (1) the annual number of production batches identified using VOCs, (2) a list of the VOCs used in batch processes, (3) a process flow diagram or similar schematic identifying each individual batch process train with a list of the products manufactured via each batch process train or equipment combination.
- 8) Sigma-Aldrich shall review equipment exhaust systems and determine equivalent flow rates for affected processes/production runs in the affected areas. For process trains where equivalent flow rates are not available, an alternate means of determining emissions shall be developed and proposed to MDNR APCP Enforcement for approval. Such alternate means may include mass balance calculations or other EPA-mandated emission calculations (i.e., Pharmaceuticals Production MACT).

- 9) For process trains where the equivalent flow rates are available, Sigma-Aldrich shall perform the Weighted Average Volatility (WAV) and Weighted Average Flow rate (WAF) calculations [per 10 CSR 10-5.540 (1)(E) and (3)(E)(2)] and make applicability determinations for each identified batch process train or equipment combination on an annual basis based on the trains or combinations identified to date.
- 10) Sigma-Aldrich shall amend its operating permit after applicability determinations are complete for affected process trains and/or after control devices are installed to demonstrate compliance (with 10 CSR 10-5.540) per the operating permit amendment requirements of 10 CSR 10-6.065, "Operating Permits". The permit amendment application(s) shall be submitted as soon as practicable but no later than 6 months after the applicability determination is made or the controls are installed.
- 11) If Sigma-Aldrich installs control device(s) to demonstrate compliance with the rule, the facility also must comply with the applicable control device monitoring, record keeping and reporting requirements of 10 CSR 10-5.540. Sigma-Aldrich may submit a request for MDNR to approval of alternate means, if necessary, to comply with the reporting, record keeping and/or monitoring requirements of 10 CSR 10-5.540.
- 12) No part of this Compliance Plan should be construed to supersede the requirement that in the event that other rules in Title 10 Division 10 of the Code of State Regulations are also applicable to specific batch process operations, the more stringent rule shall apply.
- 13) In the event Sigma-Aldrich fails to comply with its obligations under this plan, a breach of this plan shall have occurred and the MDNR shall be entitled to pursue enforcement action.
- 14) Pending the discovery of circumstances that affect control selection, alternative installation deadlines may be necessary subject to MDNR approval.
- 15) Process trains will be prioritized such that those using small-scale chemistry (i.e., chemistry in glassware or other small containers involving less than a total of ten (10) gallons of VOC per batch process train) will be analyzed for applicability under 10 CSR 10-5.540 last. Upon request, MDNR may review and approve alternative plans for such small processes.

Permit Condition EU0950-002 through EU1130-002

10 CSR 10-6.060

Construction Permits Required

Source Registration Permits Required – Permit No. 97-07-074 (Special Case), Issued on January 15, 1998
(Permit No. 99-10-072)

Emission Limitation:

- 1) The permittee shall ensure that the production of bioorganic materials shall not exceed 624 batches reacted on a twelve (12) month annual average period.
- 2) The permittee shall not emit greater than 17.9 tons of VOCs (including volatile HAPs such as methanol and toluene) and 5.35 tons of other HAPS (such as methylene chloride and other solvents) in any consecutive twelve (12) month period.
- 3) Emission levels from individual processes may be increased or decreased as long as the total emissions from the process trains do not exceed the emission limits provided above, and all other applicable permit conditions are maintained.
- 4) The following conditions apply to the three (3) stage cooling system:
 - a) During the vacuum cycles, the temperatures of the super cooling medium shall not exceed -35 °F.
 - b) The ethylene glycol cooling system shall not exceed 10 °F when utilized.
 - c) The ambient glycol system is not limited.

Monitoring:

- 1) The permittee shall ensure that at all times this batch operation takes place, the associated control devices such as condensers and caustic scrubbers are in operation.
- 2) If the emissions exceed the emission limits proposed by the permit, then the permittee may be asked by the St. Louis City Air Pollution Control Program to conduct stack tests.
- 3) Any proposed revisions to the total VOC and HAP emissions levels shall require written approval from the St. Louis City Air Pollution Control Program.
- 4) The permittee shall perform the following to ensure proper functioning of the equipment:
 - a) If leaks or abnormal conditions are detected, the appropriate measures for remediation shall be implemented within eight (8) hours.
 - b) All instruments and control equipment shall be calibrated, maintained and operated according to manufacturer's specifications.

Record Keeping:

- 1) The permittee shall keep monthly records/logs of the number of batches reacted to determine compliance with the permit conditions on a rolling twelve (12) month basis.
- 2) The permittee shall keep adequate records of raw materials, chemical usage, quantities of final products and disposal of chemicals.
- 3) The cooling system temperatures shall be recorded on a continuous or hourly basis, when the process is operating and the vapors are being condensed.
- 4) The permittee shall keep maintenance records for the condenser and caustic scrubber.

Reporting:

- 1) The permittee shall report to the St. Louis City Air Pollution Control Program within 24 hours if any condition causes a violation of the permit requirements.
- 2) The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition.

Permit Condition EU1131-002

10 CSR 10-6.060

Construction Permits Required

Source Registration Permit No. SR03.010 - Issued on May 12, 2003

Emission Limitation:

- 1) The permittee shall not emit more than 0.21 tons of VOCs during any consecutive 12-month period of time.
- 2) The permittee shall not emit more than 0.21 tons of HAPs during any consecutive 12-month period of time.

Monitoring/Record Keeping:

- 1) The permittee shall keep records of VOC and HAP emissions monthly, including a calculated total for any consecutive 12-month period of time.
- 2) The permittee shall record any exceedance of this permit condition and report to the agency within 10 days.
- 3) The permittee shall maintain all records for a minimum of 5 years.

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition, or any malfunction which causes any deviation from or an exceedance of this permit condition.

Permit Condition EU0950-003 through EU1131-003

10 CSR 10-5.350

Control of Emissions From Manufacture of Synthesized Pharmaceutical Products

Operational Requirements:

- 1) The permittee shall control the VOC emissions from all reactors, distillation operations, crystallizers, centrifuges and vacuum dryers by the use of surface condensers or equivalent controls.
 - a) If surface condensers are used, with vapor pressures as measured at twenty degrees Celsius (20°C), the condenser outlet gas temperature must not exceed:
 - i) Minus twenty-five degrees Celsius (-25°C), when condensing VOC of vapor pressure greater than 40.0 kilopascals (kPa) (5.8 psi);
 - ii) Minus fifteen degrees Celsius (-15°C), when condensing VOC of vapor pressure greater than 20.0 kPa (2.9 psi);
 - iii) Zero degrees Celsius (0°C), when condensing VOC of vapor pressure greater than 10.0 kPa (1.5 psi);
 - iv) Ten degrees Celsius (10°C), when condensing VOC of vapor pressure greater than 7.0 kPa (1.0 psi); or
 - v) Twenty-five degrees Celsius (25°C), when condensing VOC of vapor pressure greater than 3.50 kPa (0.5 psi).
 - b) If equivalent controls are used, the VOC emissions must be reduced by an amount equivalent to the reductions achieved in condition 2 above. Equivalent controls may not be used unless approved by the director.
- 2) The permittee shall reduce the VOC emissions from all air dryers and production equipment exhaust systems:
 - a) By at least ninety percent (90%) if emissions are one hundred fifty (150) kg/day, three hundred thirty (330) lbs./day or more of VOC; or
 - b) To fifteen (15) kg/day thirty-three (33) lbs./day or less if emissions are less than one hundred fifty (150) kg/day, three hundred thirty (330) lbs./day of VOC.
- 3) The permittee shall:
 - a) Provide a vapor recovery system or equivalent control that is ninety percent (90%) or more effective in reducing daily average emissions from truck or railcar deliveries to storage tanks with capacities greater than seven thousand five hundred (7,500) liters (two thousand (2,000) gallons) that store VOC with vapor pressures greater than 28.0 kPa (4.1 psi) at twenty degrees Celsius (20°C); and
 - b) Install pressure/vacuum conservation vents set at ± 0.2 kPa on all storage tanks that store VOC with vapor pressures greater than 10.0 kPa (1.5 psi) at twenty degrees Celsius (20°C), unless a more effective control system is used.
- 4) The permittee shall enclose all centrifuges, rotary vacuum filters and other filters having an exposed liquid surface, where the liquid contains VOC and exerts a total VOC vapor pressure of 3.50 kPa (0.5 psi) or more at twenty degrees Celsius (20°C).
- 5) The permittee shall install covers on all in-process tanks containing a VOC at any time. These covers must remain closed, unless production, sampling, maintenance or inspection procedures require operator access.
- 6) The permittee shall repair all leaks from which a liquid containing VOC can be observed running or dripping. The repair shall be completed the first time the equipment is off-line for a period of time long enough to complete the repair.

Monitoring/Record Keeping:

- 1) Compliance with this rule in 10 CSR 10-5.350(3)(A) and (B) and 10 CSR 10-5.350(3)(C)1. shall be determined by the testing methods referenced in 10 CSR 10-6.030(14)(A).
- 2) Owners or operators utilizing add-on control technology shall monitor and record the following parameters continuously while the affected equipment is in operation:
 - a) Exhaust gas temperature of all incinerators;
 - b) Temperature rise across a catalytic incinerator bed;
 - c) VOC breakthrough on a carbon adsorption unit;
 - d) Exit stream temperature on all condensers; and
 - e) Any other monitoring device requested by the director.
- 3) Records shall be kept on production rates sufficient to determine daily VOC emissions and any equipment test results performed in conjunction with this rule.

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this regulation, or any malfunction which causes any deviation from or an exceedance of this regulation.

Permit Condition EU0950 –004 through EU1131-004

10 CSR 10-6.075

Maximum Achievable Control Technology Regulations

40 CFR Part 63, Subpart GGG

National Emission Standards for Pharmaceutical Production – Startup, Shutdown and Malfunction

Emission/Operation Limitation:

- 1) Each provision set forth in Subpart GGG shall apply at all times except that emission limitations shall not apply during periods of: startup; shutdown; and malfunction, if the startup, shutdown, and malfunction precludes the ability of a particular emission point of an affected source to comply with one or more specific emission limitations to which it is subject and the permittee follows the provisions for periods of startup, shutdown, and malfunction, as specified in §§63.1259(a)(3) and 63.1260(i). Startup, shutdown, and malfunction are defined in §63.1251. [§63.1250(g)(1)]
- 2) The provisions set forth in §63.1255 of Subpart GGG shall apply at all times except during periods of non-operation of the pharmaceutical manufacturing process unit (PMPU) (or specific portion thereof) in which the lines are drained and depressurized resulting in the cessation of the emissions to which §63.1255 of Subpart GGG applies. [§63.1250(g)(2)]
- 3) The permittee shall not shut down items of equipment that are required or utilized for compliance with the emissions limitations of Subpart GGG during times when emissions (or, where applicable, wastewater streams or residuals) are being routed to such items of equipment, if the shutdown would contravene emissions limitations of Subpart GGG applicable to such items of equipment. §63.1250(g)(3) does not apply if the item of equipment is malfunctioning, or if the permittee must shut down the equipment to avoid damage due to a malfunction of the PMPU or portion thereof. [§63.1250(g)(3)]
- 4) During startups, shutdowns, and malfunctions when the emissions limitations of Subpart GGG do not apply pursuant to §§63.1250(g)(1) through (3), the permittee shall implement, to the extent reasonably available, measures to prevent or minimize excess emissions to the extent practical. For purposes of §63.1250(g)(4), “excess emissions” means emissions in excess of those that would have occurred if there were no startup, shutdown, or malfunction and the permittee complied with the relevant provisions of Subpart GGG. The measures to be taken shall be identified in the applicable startup, shutdown, and malfunction plan, and may include, but are not limited to, air pollution control technologies, work practices, pollution prevention, monitoring, and/or changes in the manner of operation of the source. Back-up control devices are not required, but may be used if available. [§63.1252(g)(4)]

Monitoring:

As specified in the Startup, Shutdown and Malfunction Plan.

Record Keeping:

- 1) The permittee shall keep copies of all records and reports required by Subpart GGG for at least five (5) years, as specified in §63.10(b)(1). [§63.1259(a)(1)]
- 2) The permittee shall develop and implement a written startup, shutdown, and malfunction plan as specified in §63.6(e)(3). This plan shall describe, in detail, procedures for operating and maintain the affected source during periods of startup, shutdown and malfunction and a program for corrective action for malfunctioning process, air pollution control, and monitoring equipment used to comply with Subpart GGG. The permittee shall keep the current and superseded versions of this plan onsite, as specified in §63.6(e)(3)(v). The permittee shall keep the startup, shutdown and malfunction records specified in §63.1259(b)(3)(i) through (iii). Reports related to the plan shall be submitted as specified in §63.1260(i). [§63.1259(a)(3)]
 - a) The permittee shall record the occurrence and duration of each malfunction of the process operations or of air pollution control equipment used to comply with Subpart GGG, as specified in §63.6(e)(3)(iii). [§63.1259(a)(3)(i)]

- b) The permittee shall record the occurrence and duration of each malfunction of continuous monitoring systems used to comply with Subpart GGG. [§63.1259(a)(3)(ii)]
- c) For each startup, shutdown or malfunction, the permittee shall record all information necessary to demonstrate that the procedures specified in the affected source's startup, shutdown and malfunction plan were followed, as specified in §63.6(e)(3)(iii), and shall record all maintenance performed on the air pollution control equipment, as specified in §63.10(b)(2)(iii); alternatively, the permittee shall record any actions taken that are not consistent with the plan, as specified in §63.6(e)(3)(iv). [§63.1259(a)(3)(iii)]

Reporting:

- 1) For the purposes of Subpart GGG, the startup, shutdown and malfunction reports shall be submitted on the same schedule as the periodic reports required under §63.1260(g) instead of the schedule specified in §63.10(d)(5)(i). These reports shall include the information specified in §63.1259(a)(3)(i) through (ii) and shall contain the name, title, and signature of the permittee or other responsible official who is certifying its accuracy. Reports are only required if a startup, shutdown, or malfunction occurred during the reporting period. Any time a permittee takes an action that is not consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, the permittee shall submit an immediate startup, shutdown, and malfunction report as specified in §63.10(d)(5)(ii). [§63.1260(i)(1)]
 - a) *Submittal schedule.* Except as provided in §63.1260(g)(1)(i), (ii), and (iii), the permittee shall submit Periodic reports semiannually. The first report shall be submitted no later than 240 days after the Notification of Compliance Status is due and shall cover the 6-month period beginning on the date the Notification of Compliance Status is due. Each subsequent Periodic report shall cover the 6-month period following the preceding period. [§63.1260(g)(1)]
 - i) When the Administrator determines on a case-by-case basis that more frequent reporting is necessary to accurately assess the compliance status of the affected source or; [§63.1260(g)(1)(i)]
 - ii) Quarterly reports shall be submitted when the source experiences an exceedance of a temperature limit monitored according to the provisions of §63.1258(b)(1)(iii) or an exceedance of the outlet concentration monitored according to the provisions of §63.1258(b)(1)(x) or (b)(5). Once an affected source reports quarterly, the affected source shall follow a quarterly reporting format until a request to reduce reporting frequency is approved. If the permittee submits a request to reduce the frequency of reporting, the provisions in §63.10(e)(3)(ii) and (iii) shall apply, except that the phrase "excess emissions and continuous monitoring system performance report and/or summary report" shall mean "Periodic report" for the purposes of §63.1260. [§63.1260(g)(1)(ii)]
 - iii) When a new operating scenario has been operated since the last report, in which case quarterly reports shall be submitted. [§63.1260(g)(1)(iii)]
- 2) Any time a permittee takes an action that is not consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, the permittee shall submit immediate startup, shutdown, and malfunction reports as specified in §63.10(d)(5)(ii). [§63.1260(i)(2)]

Permit Condition EU0950-005 through EU1131-005

10 CSR 10-6.075

Maximum Achievable Control Technology Regulations

40 CFR Part 63, Subpart GGG

National Emission Standards for Pharmaceutical Production – Pollution Prevention Alternative

Emission Limitation:

- 1) Except as provided in §63.1252 (e)(1) (see below), the permittee may choose to meet the pollution prevention alternative requirement specified in either §63.1252 (e)(2) or (3) for any PMPU or for any situation described in §63.1252 (e)(4), in lieu of the requirements specified in §§63.1253 (for storage tanks), 63.1254 (for process vents), 63.1255 (for equipment leaks), and 63.1256 (for wastewater). Compliance with §§63.1252 (e)(2) and (3) shall be demonstrated through the procedures in §63.1257(f). Any PMPU for which the permittee seeks to comply by using the pollution prevention alternative shall begin with the same starting material(s) and end with the same product(s). The permittee may not comply with the pollution prevention alternative by eliminating any steps of a process by transferring the step offsite (to another manufacturing location). [§63.1252(e)]
 - a) The HAP that are generated in the PMPU that are not part of the production-indexed consumption factor must be controlled according to the requirements of §§63.1253, 63.1254, 63.1255, and 63.1256. If the permittee decides to use combustion control, the HAPs that are generated as a result of combustion control of emissions must be controlled according to the requirements of § 63.1252 (g) and the hydrogen halides that are generated as a result of combustion control of emissions must be controlled according to the requirements of §63.1252 (g)(1). [§63.1252(e)(1)]
 - b) The production-indexed HAP consumption factor (kg HAP consumed/kg produced) shall be reduced by at least 75 percent from a 3 year average baseline for the time period from startup of the process until the present in which the PMPU was operational and data are available. If a time period less than 3 years is used to set the baseline, the data must represent at least 1 year's worth of data. For any reduction in the HAP factor achieved by reducing a HAP that is also a VOC, an equivalent reduction in the VOC factor is also required. For any reduction in the HAP factor that is achieved by reducing a HAP that is not a VOC, the VOC factor may not be increased. [§63.1252(e)(2)]
 - c) Both requirements specified in §§63.1252 (e)(3)(i) and (ii) below shall be met. [§63.1252(e)(3)]
 - i) The production-indexed HAP consumption factor (kg HAP consumed/kg produced) shall be reduced by at least 50 percent from a 3-year average baseline for the time period from startup of the process until the present in which the PMPU was operational and data are available. If a time period less than 3 years is used to set the baseline, the data must represent at least 1 year's worth of data. For any reduction in the HAP factor achieved by reducing a HAP that is also a VOC, an equivalent reduction in the VOC factor is also required. For any reduction in the HAP factor that is achieved by reducing a HAP that is not a VOC, the VOC factor may not be increased. [§63.1252(e)(3)(i)]
 - ii) The total PMPU HAP emissions shall be reduced by an amount, in kg/yr, that, when divided by the annual production rate, in kg/yr, and added to the reduction of the production-indexed HAP consumption factor, in kg/kg, yields a value of at least 75 percent of the average baseline HAP production-indexed consumption factor established according to §63.1252 (e)(3)(i) according to the equation provided in §63.1257(f)(2)(ii)(A). The total PMPU VOC emissions shall be reduced by an amount calculated according to the equation provided in §63.1257(f)(2)(ii)(B). The annual reduction in HAP and VOC air emissions must be due to the use of the following control devices: [§63.1252(e)(3)(ii)]
 - (1) Combustion control devices such as incinerators, flares or process heaters. [§63.1252(e)(3)(ii)(A)]
 - (2) Control devices such as condensers and carbon adsorbers whose recovered product is destroyed or shipped offsite for destruction. [§63.1252(e)(3)(ii)(B)]
 - (3) Any control device that does not ultimately allow for recycling of material back to the PMPU. [§63.1252(e)(3)(ii)(C)]
 - (4) Any control device for which the permittee can demonstrate that the use of the device in controlling HAP emissions will have no effect on the production-indexed consumption factor for the PMPU. [§63.1252(e)(3)(ii)(D)]
 - d) The permittee may comply with the requirements in either §63.1252 (e)(2) or (3) for a series of processes, including situations where multiple processes are merged, subject to the following conditions: [§63.1252(e)(4)]

- i) The baseline period shall be a single year beginning no earlier than the 1992 calendar year. [§63.1252(e)(4)(i)]
- ii) The term "PMPU" shall have the meaning provided in § 63.1251 except that the baseline and modified PMPU may include multiple processes (i.e., precursors, active ingredients, and final dosage form) if the permittee demonstrates to the satisfaction of the Administrator that the multiple processes were merged after the baseline period into an existing process or processes. [§63.1252(e)(4)(ii)]
- iii) Non-dedicated formulation and solvent recovery processes may not be merged with any other processes. [§63.1252(e)(4)(iii)]

Test Methods and Compliance Demonstration:

- 1) *Pollution prevention alternative standard.* The permittee shall demonstrate compliance with § 63.1252(e)(2) using the procedures described below in §§63.1257 (f)(1) and (f)(3). The permittee shall demonstrate compliance with §63.1252(e)(3) using the procedures described below in §§63.1257 (f)(2) and (f)(3). [§63.1257(f)]
 - a) Compliance is demonstrated when the annual kg/kg factor, calculated according to the procedure in §§63.1257 (f)(1)(i) and (iii), is reduced by at least 75 percent as calculated according to the procedure in §§63.1257 (f)(1)(i) and (ii). [§63.1257(f)(1)]
 - i) The production-indexed HAP consumption factors shall be calculated by dividing annual consumption of total HAP by the annual production rate, per process. The production-indexed total VOC consumption factor shall be calculated by dividing annual consumption of total VOC by the annual production rate, per process. [§63.1257(f)(1)(i)]
 - ii) The baseline factor is calculated from yearly production and consumption data for the first 3-year period in which the PMPU was operational, beginning no earlier than the 1987 calendar year, or for a minimum period of 12 months from startup of the process until the present in which the PMPU was operational and data are available, beginning no earlier than the 1987 calendar year. [§63.1257(f)(1)(ii)]
 - iii) The annual factor is calculated on the following bases: [§63.1257(f)(1)(iii)]
 - (1) For continuous processes, the annual factor shall be calculated every 30 days for the 12-month period preceding the 30th day (30-day rolling average). [§63.1257(f)(1)(iii)(A)]
 - (2) For batch processes, the annual factor shall be calculated either every 10 batches for the 12-month period preceding the 10th batch (10-batch rolling average) or a maximum of once per month, if the number of batches is greater than 10 batches per month. The annual factor shall be calculated every 5 batches if the number of batches is less than 10 for the 12-month period preceding the 10th batch and shall be calculated every year if the number of batches is less than 5 for the 12-month period preceding the 5th batch. [§63.1257(f)(1)(iii)(B)]
 - b) Compliance is demonstrated when the requirements of §§63.1257 (f)(2)(i) through (iv) are met. (§63.1257(f)(2))
 - i) The annual kg/kg factor, calculated according to the procedure in §§63.1257 (f)(1)(i) and (f)(1)(iii), is reduced to a value equal to or less than 50 percent of the baseline factor calculated according to the procedure in §§63.1257 (f)(1)(i) and (ii). [§63.1257(f)(2)(i)]
 - ii) The yearly reductions associated with add-on controls that meet the criteria of §§63.1252(h)(3)(ii)(A) through (D) must be equal to or greater than the amounts calculated in §§63.1257 (f)(2)(ii)(A) and (B): [§63.1257(f)(2)(ii)]
 - (1) The mass of HAP calculated using Equation 55 of Subpart GGG: [§63.1257(f)(2)(ii)(A)]

$$M = [\text{kg/kg}]_b(0.75 - P_R)(M_{\text{prod}}) \quad (\text{Eq. 55})$$

Where:

$[\text{kg/kg}]_b$ = the baseline production-indexed HAP consumption factor, in kg/kg

M_{prod} = the annual HAP production rate, in kg/yr

M = the annual reduction required by add-on controls, in kg/yr

P_R = the fractional reduction in the annual kg/kg factor achieved using pollution prevention where P_R is ≥ 0.5

- (2) The mass of VOC calculated using Equation 56 of Subpart GGG: [§63.1257(f)(2)(ii)(B)]

$$\text{VOC}_{\text{reduced}} = (\text{VF}_{\text{base}} - \text{VF}_P - \text{VF}_{\text{annual}}) \times M_{\text{prod}} \quad (\text{Eq. 56})$$

Where:

$VOC_{reduced}$ = required VOC emission reduction from add-on controls, kg/yr

VF_{base} = baseline VOC factor, kg VOC emitted/kg production

VF_p = reduction in VOC factor achieved by pollution prevention, kg VOC emitted/kg production

VF_{annual} = target annual VOC factor, kg VOC emitted/kg production

M_{prod} = production rate, kg/yr

- iii) Demonstration that the criteria in §§63.1252(e)(3)(ii)(A) through (D) are met shall be accomplished through a description of the control device and of the material streams entering and exiting the control device. [§63.1257(f)(2)(iii)]
- iv) The annual reduction achieved by the add-on control shall be quantified using the methods described in § 63.1257(d). [§63.1257(f)(2)(iv)]
- c) Each permittee of a PMPU complying with the pollution prevention(P2) standard shall prepare a P2 demonstration summary that shall contain, at a minimum, the following information: [§63.1257(f)(3)]
 - (i) Descriptions of the methodologies and forms used to measure and record daily consumption of HAP compounds reduced as part of the P2 standard. [§63.1257(f)(3)(i)]
 - (ii) Descriptions of the methodologies and forms used to measure and record daily production of products, which are included in the P2 standard. [§63.1257(f)(3)(ii)]
 - (iii) Supporting documentation for the descriptions provided in §§63.1257 (f)(3)(i) and (ii) including, but not limited to, operator log sheets and copies of daily, monthly, and annual inventories of materials and products. [§63.1257(f)(3)(iii)]

Monitoring:

Pollution prevention. The permittee of any affected source that chooses to comply with the requirements of §§63.1252(e)(2) and (3) shall calculate a yearly rolling average of kg HAP consumption per kg production and kg VOC consumption per kg production every month or every 10 batches. Each rolling average kg/kg factor that exceeds the value established in §63.1257(f)(1)(ii) will be considered a violation of the emission limit. [§63.1258(e)]

Record Keeping:

For processes subject to §63.1252(e), records of consumption, production, and the rolling average values of the production-indexed HAP and VOC consumption factors must be kept. [§63.1259(b)(2)]

Reporting:

Precompliance report: For permittees complying with the requirements of §63.1252(e), the P2 demonstration summary required in §63.1257(f). [§63.1260)(e)(4)]

Permit Condition EU0950-006 through EU1131-006

10 CSR 10-6.075

Maximum Achievable Control Technology Regulations

40 CFR Part 63, Subpart GGG

National Emission Standards for Pharmaceuticals Production- Standards for Process Vents

Emission Limitation:

- 1) *Pollution Prevention Alternative:* The permittee may choose to meet the pollution prevention alternative requirement specified in Permit Condition EU0950-005 through EU1131-005 for any PMPU in lieu of the requirements specified in §63.1254 (for process vents). [§63.1252(e)]
- 2) Opening of a safety device, as defined in §63.1251, is allowed at any time conditions require it to do so to avoid unsafe conditions. [§63.1252(a)]
- 3) The permittee of a closed-vent system that contains bypass lines that could divert a vent stream away from a control device used to comply with the requirements in §63.1254 shall comply with the requirements of Table 4 to Subpart GGG and §63.1252(b)(1) or (2). Equipment such as low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, rupture disks and pressure relief valves needed for safety purposes are not subject to this paragraph. [§63.1252(b)]
 - a) Install, calibrate, maintain, and operate a flow indicator that determines whether vent stream flow is present at least once every 15 minutes. Records shall be maintained as specified in §63.1259(i)(6)(i). The flow indicator shall be installed at the entrance to any bypass line that could divert the vent stream away from the control device to the atmosphere or; [§63.1252(b)(1)]
 - b) Secure the bypass line valve in the closed position with a car seal or lock and key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and the vent stream is not diverted through the bypass line. Records shall be maintained as specified in §63.1259(i)(6)(ii). [§63.1252(b)(2)]
- 4) *Annual mass limit.* The actual HAP emissions from the sum of all process vents for which the permittee is not complying with the process based emission reduction standard are limited to 900 kg in any 365-day period. [§63.1254(b)(2)]

Testing Methods and Compliance Procedures:

- 1) *Test methods:* When testing is conducted to measure emissions from an affected source, the test methods specified in §63.1257(b)(1) through (9) shall be used. [§63.1257(b)]
 - a) EPA Method 1 or 1A of appendix A of 40 CFR part 60 is used for sample and velocity traverses. [§63.1257(b)(1)]
 - b) EPA Method 2, 2A, 2C, or 2D of appendix A of 40 CFR part 60 is used for velocity and volumetric flow rates. [§63.1257(b)(2)]
 - c) EPA Method 3 of appendix A of 40 CFR part 60 is used for gas analysis. [§63.1257(b)(3)]
 - d) EPA Method 4 of appendix A of 40 CFR part 60 is used for stack gas moisture. [§63.1257(b)(4)]
 - e) The following methods are specified for concentration measurements: [§63.1257(b)(6)]
 - i) Method 18 of appendix A of 40 CFR part 60 may be used to determine HAP concentration in any control device efficiency determination. [§63.1257(b)(6)(i)]
 - ii) Method 25 of appendix A of 40 CFR part 60 may be used to determine total gaseous nonmethane organic concentration for control efficiency determinations in combustion devices. [§63.1257(b)(6)(ii)]
 - iii) Method 26 or 26A of appendix A of 40 CFR part 60 shall be used to determine hydrogen chloride, hydrogen halide and halogen concentrations in control device efficiency determinations or in the 20 ppmv outlet hydrogen halide concentration standard. [§63.1257(b)(6)(iii)]
 - iv) Method 25A of appendix A of 40 CFR part 60 may be used to determine the HAP or TOC concentration for control device efficiency determinations under the conditions specified in Method 25 of appendix A for direct measurement of an effluent with a flame ionization detector, or in demonstrating compliance with the 20 ppmv TOC outlet standard. If Method 25A is used to determine the concentration of TOC for the 20 ppmv standard, the instrument shall be calibrated on methane or the predominant HAP. If calibrating on the predominant HAP, the use of Method 25A shall comply with §63.1257(b)(6)(iv)(A) through (C). [§63.1257(b)(6)(iv)]

- (1) The organic HAP used as the calibration gas for Method 25A, 40 CFR part 60, appendix A, shall be the single organic HAP representing the largest percent by volume. [§63.1257(b)(6)(iv)(A)]
- (2) The use of Method 25A, 40 CFR part 60, appendix A, is acceptable if the response from the high level calibration gas is at least 20 times the standard deviation of the response from the zero calibration gas when the instrument is zeroed on the most sensitive scale. [§63.1257(b)(6)(iv)(B)]
- (3) The span value of the analyzer must be less than 100 ppmv. [§63.1257(b)(6)(iv)(C)]

2) *Initial compliance with process vent provisions.*

- a) Initial compliance with §63.1254(b)(2), the annual mass limit, is demonstrated when the actual emissions of HAP from the sum of all process vents within a process is less than or equal to 900 kg/yr. Uncontrolled HAP emissions and controlled HAP emissions shall be determined using the procedures described in §63.1257(d)(2) and (3). [§63.1257(d)(1)(i)]
- b) *Uncontrolled emissions.* The permittee complying with the emission limitation required by §63.1254(b)(2), the annual mass limit for new sources, for each process vent within a process, shall calculate uncontrolled emissions from all equipment in the process according to the procedures described in §63.1257(d)(2)(i) or (ii), as appropriate. [§63.1257(d)(2)]
- i) *Emission estimation procedures.* The permittee shall determine uncontrolled emissions of HAP using measurements and/or calculations for each batch emission episode within each unit operation according to the engineering evaluation methodology in §63.1257(d)(2)(i)(A) through (H). Except where variations are noted, individual HAP partial pressures in multicomponent systems shall be determined by the following methods: If the components are miscible in one another, use Raoult's law to calculate the partial pressures; if the solution is a dilute aqueous mixture, use Henry's law to calculate partial pressures; if Raoult's law or Henry's law are not appropriate or available, use experimentally obtained activity coefficients or models such as the group-contribution models, to predict activity coefficients, or assume the components of the system behave independently and use the summation of all vapor pressures from the HAP as the total HAP partial pressure. Chemical property data can be obtained from standard reference texts. [§63.1257(d)(2)(i)]
- (1) *Vapor displacement.* Emissions from vapor displacement due to transfer of material shall be calculated using Equation 11 of Subpart GGG. The individual HAP partial pressures may be calculated using Raoult's law. [§63.1257(d)(2)(i)(A)]

$$E = \frac{(V)}{(R)(T)} \times \sum_{i=1}^n (P_i)(MW_i) \quad (Eq. 11)$$

where:

E = mass of HAP emitted

V = volume of gas displaced from the vessel

R = ideal gas law constant

T = temperature of the vessel vapor space; absolute

P_i = partial pressure of the individual HAP

MW_i = molecular weight of the individual HAP

n = number of HAP compounds in the emission stream i = identifier for a HAP compound

- (2) *Purging.* Emissions from purging shall be calculated using Equation 12 of Subpart GGG. The partial pressures of individual condensable compounds may be calculated using Raoult's law, the pressure of the vessel vapor space may be set equal to 760 mmHg, and the partial pressure of HAP shall be assumed to be 25 percent of the saturated value if the purge flow rate is greater than 100 standard cubic feet per minute (scfm). [§63.1257(d)(2)(i)(B)]

$$E = \sum_{i=1}^n P_i MW_i \times \frac{(V)(f)}{(R)(T)} \times \frac{P_i}{P_T - \sum_{j=1}^n (P_j)} \quad (Eq. 12)$$

Where:

E = mass of HAP emitted

V = purge flow rate at the temperature and pressure of the vessel vapor space

R = ideal gas law constant
T = temperature of the vessel vapor space; absolute
P_i = partial pressure of the individual HAP
P_j = partial pressure of individual condensable VOC compounds (including HAP)
P_T = pressure of the vessel vapor space
MW_i = molecular weight of the individual HAP
t = time of purge
n = number of HAP compounds in the emission stream
i = identifier for a HAP compound
j = identifier for a condensable compound
m = number of condensable compounds (including HAP) in the emission stream

- (3) *Heating*. Emissions caused by the heating of a vessel to a temperature equal to or lower than 10 K below the boiling point shall be calculated using the procedures in either §63.1257(d)(2)(i)(C)(1) or (3). Emissions caused by heating a vessel to a temperature that is higher than 10 K below the boiling point and less than the boiling point, must be calculated using the procedures in either §63.1257(d)(2)(i)(C)(2) or (3). If the contents of a vessel are heated to the boiling point, emissions must be calculated using the procedures in §63.1257(d)(2)(i)(C)(4). [§63.1257(d)(2)(i)(C)]

- (a) This paragraph describes procedures to calculate emissions if the final temperature to which the vessel contents are heated is 10 K below the boiling point of the HAP in the vessel, or lower. The permittee shall calculate the mass of HAP emitted per episode using either Equation 13 or 14 of Subpart GGG. The moles of noncondensable gas displaced are calculated using Equation 15 of Subpart GGG. The initial and final pressure of the noncondensable gas in the vessel shall be calculated using Equation 16 of Subpart GGG. The average molecular weight of HAP in the displaced gas shall be calculated using Equation 17 of Subpart GGG. [§63.1257(d)(2)(i)(C)(1)]

$$E = \frac{\sum_{i=1}^n ((P_i^*)(x_i)(MW_i))}{760 - \sum_{j=1}^m ((P_j^*)(x_j))} \times \Delta\eta \quad (\text{Eq. 13})$$

$$E = \frac{\frac{\sum_{i=1}^n (P_i)_{T1}}{Pa_1} + \frac{\sum_{i=1}^n (P_i)_{T2}}{Pa_2}}{2} \times \Delta\eta \times MW_{HAP} \quad (\text{Eq. 14})$$

$$\Delta\eta = \frac{V}{R} \left[\left(\frac{Pa_1}{T_1} \right) - \left(\frac{Pa_2}{T_2} \right) \right] \quad (\text{Eq. 15})$$

$$Pa_2 = P_{atm} - \sum_{j=1}^m (P_j)_{T2} \quad (\text{Eq. 16})$$

$$MW_{HAP} = \frac{\sum_{i=1}^n ((P_i)_{T1} + (P_i)_{T2}) MW_i}{\sum_{i=1}^n ((P_i)_{T1} + (P_i)_{T2})} \quad (\text{Eq. 17})$$

Where:

E = mass of HAP vapor displaced from the vessel being heated
x_i = mole fraction of each HAP in the liquid phase
x_j = mole fraction of each condensable VOC (including HAP) in the liquid phase
P_i* = vapor pressure of each HAP in the vessel headspace at any temperature between the initial and final heatup temperatures, mmHg.
P_j* = vapor pressure of each condensable VOC (including HAP) in the vessel headspace at any temperature between the initial and final heatup temperatures, mmHg.

760 = atmospheric pressure, mmHg

MW_{HAP} = the average molecular weight of HAP present in the displaced gas

Δn = number of moles of noncondensable gas displaced

V = volume of free space in the vessel

R = ideal gas law constant

T_1 = initial temperature of vessel contents, absolute

T_2 = final temperature of vessel contents, absolute

P_{a_n} = partial pressure of noncondensable gas in the vessel headspace at initial (n=1) and final (n=2) temperature

P_{atm} = atmospheric pressure (when Δn is used in Equation 13 of Subpart GGG, P_{atm} may be set equal to 760 mmHg for any vessel)

$(P_j)T_n$ = partial pressure of each condensable compound (including HAP) in the vessel headspace at the initial temperature (n=1) and final (n=2) temperature

m = number of condensable compounds (including HAP) in the displaced vapor

j = identifier for a condensable compound

$(P_i)T_n$ = partial pressure of each HAP in the vessel headspace at initial (T_1) and final (T_2) temperature

MW_i = molecular weight of the individual HAP

n = number of HAP compounds in the emission stream

i = identifier for a HAP compound

- (b) If the vessel contents are heated to a temperature that is higher than 10 K below the boiling point and less than the boiling point, emissions must be calculated using the procedures in §63.1257(d)(2)(i)(C)(2)(i), or (ii), or (iii). [§63.1257(d)(2)(i)(C)(2)]
- (i) Use Equation 13 of Subpart GGG. In Equation 13 of Subpart GGG, the HAP vapor pressures must be determined at the temperature 10 K below the boiling point. In the calculation of Δn for Equation 13 of Subpart GGG, T_2 must be the temperature 10 K below the boiling point, and P_{a_2} must be determined at the temperature 10 K below the boiling point. [§63.1257(d)(2)(i)(C)(2)(i)]
- (ii) Use Equation 14 of Subpart GGG. In Equation 14 of Subpart GGG, the HAP partial pressures must be determined at the temperature 10 K below the boiling point. In the calculation of Δn for Equation 14 of Subpart GGG, T_2 must be the temperature 10 K below the boiling point, and P_{a_2} must be determined at the temperature 10 K below the boiling point. In the calculation of MW_{HAP} , the HAP partial pressures must be determined at the temperature 10 K below the boiling point. [§63.1257(d)(2)(i)(C)(2)(ii)]
- (iii) Use Equation 14 of Subpart GGG over specific temperature increments. If the initial temperature is lower than 10 K below the boiling point, emissions must be calculated as the sum over two increments; one increment is from the initial temperature to 10 K below the boiling point, and the second is from 10 K below the boiling point to the lower of either the final temperature or the temperature 5 K below the boiling point. If the initial temperature is higher than 10 K below the boiling point, emissions are calculated over one increment from the initial temperature to the lower of either the final temperature or the temperature 5 K below the boiling point. [§63.1257(d)(2)(i)(C)(2)(iii)]
- (c) Emissions caused by heating a vessel are calculated as follows:
- (i) Equation 18 of Subpart GGG must be used. [§63.1257(d)(2)(i)(C)(3)(i)]

$$E = MW_{HAP} \times \left[N_{avg} \times \ln \left(\frac{P_T - \sum_{j=1}^m (P_{j,1})}{P_T - \sum_{j=1}^m (P_{j,2})} \right) - (n_{1,2} - n_{1,1}) \right] \quad (Eq. 18)$$

Where:

E = mass of HAP vapor displaced from the vessel being heated

N_{avg} = average gas space molar volume during the heating process

P_T = total pressure in the vessel

$P_{i,1}$ = partial pressure of the individual HAP compounds at T_1

$P_{i,2}$ = partial pressure of the individual HAP compounds at T_2

MW_{HAP} = average molecular weight of the HAP compounds

n_{i,1} = number of moles of condensable in the vessel headspace at T₁

n_{i,2} = number of moles of condensable in the vessel headspace at T₂

n = number of HAP compounds in the emission stream

- (ii) The average gas space molar volume during the heating process is calculated using Equation 19 of Subpart GGG. [§63.1257(d)(2)(i)(C)(3)(ii)]

$$N_{avg} = \frac{VP_T}{2R} \left(\frac{1}{T_1} + \frac{1}{T_2} \right) \quad (Eq. 19)$$

Where:

N_{avg} = average gas space molar volume during the heating process

V = volume of free space in vessel

P_T = total pressure in the vessel

R = ideal gas law constant

T₁ = initial temperature of the vessel

T₂ = final temperature of the vessel

- (iii) The difference in the number of moles of condensable in the vessel headspace between the initial and final temperatures is calculated using Equation 20 of Subpart GGG. [§63.1257(d)(2)(i)(C)(3)(iii)]

$$(n_{i,2} - n_{i,1}) = \frac{V}{(R)(T_2)} \sum_{i=1}^n P_{i,2} - \frac{V}{(R)(T_1)} \sum_{i=1}^n P_{i,1} \quad (Eq. 20)$$

Where:

V = volume of free space in vessel

R = ideal gas law constant

T₁ = initial temperature in the vessel

T₂ = final temperature in the vessel

P_{i,1} = partial pressure of the individual HAP compounds at T₁

P_{i,2} = partial pressure of the individual HAP compounds at T₂

n = number of HAP compounds in the emission stream

- (d) If the vessel contents are heated to the boiling point, emissions must be calculated using the procedure in §63.1257(d)(2)(i)(C)(4)(i) and (ii). [§63.1257(d)(2)(i)(C)(4)]
- (i) Use either of the procedures in §63.1257(d)(3)(i)(B)(3) to calculate the emissions from heating to the boiling point (note that P_{a2} = 0 in the calculation of; and; [§63.1257(d)(2)(i)(C)(4)(i)]
- (ii) While boiling, the vessel must be operated with a properly operated process condenser. An initial demonstration that a process condenser is properly operated is required for some process condensers, as described in §63.1257(d)(3)(iii). [§63.1257(d)(2)(i)(C)(4)(ii)]
- (4) *Depressurization.* Emissions from depressurization shall be calculated using the procedures in either §63.1257(d)(2)(i)(D)(1) through (4), §63.1257(d)(2)(i)(D)(5) through (9), or §63.1257(d)(2)(i)(D)(10). [§63.1257(d)(2)(i)(D)]
- (1) Equations 21 and 22 of Subpart GGG are used to calculate the initial and final volumes of noncondensable gas present in the vessel, adjusted to atmospheric pressure. The HAP partial pressures may be calculated using Raoult's law. [§63.1257(d)(2)(i)(D)(1)]

$$V_{nc1} = \frac{VP_{nc1}}{760} \quad (Eq. 21)$$

$$V_{nc2} = \frac{VP_{nc2}}{760} \quad (Eq. 22)$$

Where:

V_{nc1} = initial volume of noncondensable gas in the vessel

V_{nc2} = final volume of noncondensable gas in the vessel

V = free volume in the vessel being depressurized

P_{nc1} = initial partial pressure of the noncondensable gas, as calculated using Equation 23 of Subpart GGG, mmHg

P_{nc2} = final partial pressure of the noncondensable gas, as calculated using Equation 24 of Subpart GGG, mmHg

760 = atmospheric pressure, mmHg

- (2) The initial and final partial pressures of the noncondensable gas in the vessel are determined using Equations 23 and 24 of Subpart GGG: [§63.1257(d)(2)(i)(D)(2)]

$$P_{nc1} = P_1 - \sum_{j=1}^m (P_j^*)(x_j) \quad (\text{Eq. 23})$$

$$P_{nc2} = P_2 - \sum_{j=1}^m (P_j^*)(x_j) \quad (\text{Eq. 24})$$

Where:

P_{nc1} = initial partial pressure of the noncondensable gas

P_{nc2} = final partial pressure of the noncondensable gas

P_1 = initial vessel pressure

P_2 = final vessel pressure

P_j^* = vapor pressure of each condensable (including HAP) in the emission stream

x_j = mole fraction of each condensable (including HAP) in the liquid phase

m = number of condensable compounds (including HAP) in the emission stream

j = identifier for a condensable compound

- (3) The average ratio of moles of noncondensable to moles of an individual HAP in the emission stream is calculated using Equation 25 of Subpart GGG; this calculation must be repeated for each HAP in the emission stream: [§63.1257(d)(2)(i)(D)(3)]

$$n_{Ri} = \frac{\left(\frac{P_{nc1}}{(P_i^*)(x_i)} + \frac{P_{nc2}}{(P_i^*)(x_i)} \right)}{2} \quad (\text{Eq. 25})$$

Where:

n_{Ri} = average ratio of moles of noncondensable to moles of individual HAP

P_{nc1} = initial partial pressure of the noncondensable gas, as calculated using Equation 23 of Subpart GGG

P_{nc2} = final partial pressure of the noncondensable gas, as calculated using Equation 24 of Subpart GGG

P_i^* = vapor pressure of each individual HAP

x_i = mole fraction of each individual HAP in the liquid phase.

n = number of HAP compounds

i = identifier for a HAP compound

- (4) The mass of HAP emitted shall be calculated using Equation 26 of Subpart GGG: [§63.1257(d)(2)(i)(D)(4)]

$$E = (V_{nc1} - V_{nc2}) \times \frac{P_{atm}}{RT} \times \sum_{i=1}^n \frac{MW_i}{n_{Ri}} \quad (\text{Eq. 26})$$

Where:

E = mass of HAP emitted

V_{nc1} = initial volume of noncondensable gas in the vessel, as calculated using Equation 21 of Subpart GGG

V_{nc2} = final volume of noncondensable gas in the vessel, as calculated using Equation 22 of Subpart GGG

n_{Ri} = average ratio of moles of noncondensable to moles of individual HAP, as calculated using Equation 25 of Subpart GGG

P_{atm} = atmospheric pressure, standard

R = ideal gas law constant

T = temperature of the vessel, absolute

MW_i = molecular weight of each HAP

- (5) The moles of HAP vapor initially in the vessel are calculated using the ideal gas law using Equation 27 of Subpart GGG: [§63.1257(d)(2)(i)(D)(5)]

$$n_{HAP} = \frac{(Y_{HAP})(V)(P)}{RT} \quad (Eq. 27)$$

Where:

Y_{HAP} = mole fraction of HAP (the sum of the individual HAP fractions, ΣY_i)

V = free volume in the vessel being depressurized

P_1 = initial vessel pressure

R = ideal gas law constant

T = vessel temperature, absolute

- (6) The initial and final moles of noncondensable gas present in the vessel are calculated using Equations 28 and 29 of Subpart GGG: [§63.1257(d)(2)(i)(D)(6)]

$$n_1 = \frac{VP_{n1}}{RT} \quad (Eq. 28)$$

$$n_2 = \frac{VP_{n2}}{RT} \quad (Eq. 29)$$

Where:

n_1 = initial number of moles of noncondensable gas in the vessel

n_2 = final number of moles of noncondensable gas in the vessel

V = free volume in the vessel being depressurized

P_{n1} = initial partial pressure of the noncondensable gas, as calculated using Equation 23 of Subpart GGG

P_{n2} = final partial pressure of the noncondensable gas, as calculated using Equation 24 of Subpart GGG

R = ideal gas law constant

T = temperature, absolute

- (7) The initial and final partial pressures of the noncondensable gas in the vessel are determined using Equations 23 and 24 of Subpart GGG. [§63.1257(d)(2)(i)(D)(7)]
- (8) The moles of HAP emitted during the depressurization are calculated by taking an approximation of the average ratio of moles of HAP to moles of noncondensable and multiplying by the total moles of noncondensables released during the depressurization, using Equation 30 of Subpart GGG: [§63.1257(d)(2)(i)(D)(8)]

$$n_{HAP} = \left[\frac{\frac{n_{HAP,1}}{n_1} + \frac{n_{HAP,2}}{n_2}}{2} \right] [n_1 - n_2] \quad (Eq. 30)$$

where:

n_{HAP} = moles of HAP emitted

n_1 = initial number of moles of noncondensable gas in the vessel, as calculated using Equation 28 of Subpart GGG

n_2 = final number of moles of noncondensable gas in the vessel, as calculated using Equation 29 of Subpart GGG

- (9) The mass of HAP emitted can be calculated using Equation 31 of Subpart GGG:
[§63.1257(d)(2)(i)(D)(9)]

$$E = \eta_{\text{HAP}} * MW_{\text{HAP}} \quad (\text{Eq. 31})$$

where:

E = mass of HAP emitted

η_{HAP} = moles of HAP emitted, as calculated using Equation 30 of Subpart GGG

MW_{HAP} = average molecular weight of the HAP as calculated using Equation 17 of Subpart GGG.

- (10) Emissions from depressurization may be calculated using equation 32 of Subpart GGG:
[§63.1257(d)(2)(i)(D)(10)]

$$E = \frac{V}{(R)(T)} \times 10^6 \left(\frac{P_1 - \sum_{j=1}^m (P_j)}{P_2 - \sum_{j=1}^m (P_j)} \right) \times \sum_{i=1}^n (P_i)(MW_i) \quad (\text{Eq. 32})$$

Where:

V = free volume in vessel being depressurized

R = ideal gas law constant

T = temperature of the vessel, absolute

P_1 = initial pressure in the vessel

P_2 = final pressure in the vessel

P_j = partial pressure of the individual condensable compounds (including HAP)

MW_i = molecular weight of the individual HAP compounds

n = number of HAP compounds in the emission stream

m = number of condensable compounds (including HAP) in the emission stream

i = identifier for a HAP compound

j = identifier for a condensable compound.

- (5) *Vacuum systems.* Emissions from vacuum systems may be calculated using Equation 33 of Subpart GGG if the air leakage rate is known or can be approximated. The individual HAP partial pressures may be calculated using Raoult's Law. [§63.1257(d)(2)(i)(E)]

$$E = \frac{(La)(t)}{MW_{nc}} \left(\frac{\sum_{i=1}^n P_i MW_i}{P_{\text{system}} - \sum_{j=1}^m P_j} \right) \quad (\text{Eq. 33})$$

Where:

E = mass of HAP emitted

P_{system} = absolute pressure of receiving vessel or ejector outlet conditions, if there is no receiver

P_i = partial pressure of the HAP at the receiver temperature or the ejector outlet conditions

P_j = partial pressure of condensable (including HAP) at the receiver temperature or the ejector outlet conditions

La = total air leak rate in the system, mass/time

MW_{nc} = molecular weight of noncondensable gas

t = time of vacuum operation

MW_i = molecular weight of the individual HAP in the emission stream, with HAP partial pressures calculated at the temperature of the receiver or ejector outlet, as appropriate

- (6) *Gas evolution.* Emissions from gas evolution shall be calculated using Equation 12 of Subpart GGG with V calculated using Equation 34 of Subpart GGG: [§63.1257(d)(2)(i)(F)]

$$V = \frac{(W_g)(R)(T)}{(P_T)(MW_g)} \quad (\text{Eq. 34})$$

Where:

V = volumetric flow rate of gas evolution
W_g = mass flow rate of gas evolution
R = ideal gas law constant
T = temperature at the exit, absolute
P_T = vessel pressure
MW_g = molecular weight of the evolved gas

- (7) *Air drying.* Emissions from air drying shall be calculated using Equation 35 of Subpart GGG: [§63.1257(d)(2)(i)(G)]

$$E = B \times \left(\frac{PS_1}{100 - PS_1} - \frac{PS_2}{100 - PS_2} \right) \quad (\text{Eq. 35})$$

Where:

E = mass of HAP emitted
B = mass of dry solids
PS₁ = HAP in material entering dryer, weight percent
PS₂ = HAP in material exiting dryer, weight percent

- (8) *Empty vessel purging.* Emissions from empty vessel purging shall be calculated using Equation 36 of Subpart GGG (Note: The term $e^{-Ft/V}$ can be assumed to be 0): [§63.1257(d)(2)(i)(H)]

$$E = \left(\frac{V}{RT} \times \left(\sum_{i=1}^n (P_i)(MW_i) \right) (1 - e^{-Ft/V}) \right) \quad (\text{Eq. 36})$$

Where:

V = volume of empty vessel
R = ideal gas law constant
T = temperature of the vessel vapor space; absolute
P_i = partial pressure of the individual HAP at the beginning of the purge
(MW_i) = molecular weight of the individual HAP
F = flowrate of the purge gas
t = duration of the purge
n = number of HAP compounds in the emission stream
i = identifier for a HAP compound

- ii) *Engineering assessments.* The permittee shall conduct an engineering assessment to calculate uncontrolled HAP emissions for each emission episode that is not due to vapor displacement, purging, heating, depressurization, vacuum operations, gas evolution, or air drying. For emission episodes caused by any of these types of activities, the permittee also may calculate uncontrolled HAP emissions based on an engineering assessment if the permittee can demonstrate to the Administrator that the methods in §63.1257(d)(2)(i) are not appropriate. Modified versions of the engineering evaluation methods in §63.1257(d)(2)(i)(A) through (H) may be used if the permittee demonstrates that they have been used to meet other regulatory obligations, and they do not affect applicability assessments or compliance determinations under Subpart GGG GGG. One criterion the permittee could use to demonstrate that the methods in §63.1257(d)(2)(i) are not appropriate is if previous test data are available that show a greater than 20 percent

n_1 = initial number of moles of noncondensable gas in the vessel, as calculated using Equation 28 of Subpart GGG

n_2 = final number of moles of noncondensable gas in the vessel, as calculated using Equation 29 of Subpart GGG

- (9) The mass of HAP emitted can be calculated using Equation 31 of Subpart GGG:
[§63.1257(d)(2)(i)(D)(9)]

$$E = \eta_{\text{HAP}} * MW_{\text{HAP}} \quad (\text{Eq. 31})$$

where:

E = mass of HAP emitted

η_{HAP} = moles of HAP emitted, as calculated using Equation 30 of Subpart GGG

MW_{HAP} = average molecular weight of the HAP as calculated using Equation 17 of Subpart GGG.

- (10) Emissions from depressurization may be calculated using equation 32 of Subpart GGG:
[§63.1257(d)(2)(i)(D)(10)]

$$E = \frac{V}{(R)(T)} \times \ln \left(\frac{P_1 - \sum_{j=1}^m (P_j)}{P_2 - \sum_{j=1}^m (P_j)} \right) \times \sum_{i=1}^n (P_i)(MW_i) \quad (\text{Eq. 32})$$

Where:

V = free volume in vessel being depressurized

R = ideal gas law constant

T = temperature of the vessel, absolute

P_1 = initial pressure in the vessel

P_2 = final pressure in the vessel

P_j = partial pressure of the individual condensable compounds (including HAP)

MW_i = molecular weight of the individual HAP compounds

n = number of HAP compounds in the emission stream

m = number of condensable compounds (including HAP) in the emission stream

i = identifier for a HAP compound

j = identifier for a condensable compound.

- (5) *Vacuum systems.* Emissions from vacuum systems may be calculated using Equation 33 of Subpart GGG if the air leakage rate is known or can be approximated. The individual HAP partial pressures may be calculated using Raoult's Law. [§63.1257(d)(2)(i)(E)]

$$E = \frac{(La)(t)}{MW_{nc}} \left(\frac{\sum_{i=1}^n P_i MW_i}{P_{\text{system}} - \sum_{j=1}^m P_j} \right) \quad (\text{Eq. 33})$$

Where:

E = mass of HAP emitted

P_{system} = absolute pressure of receiving vessel or ejector outlet conditions, if there is no receiver

P_i = partial pressure of the HAP at the receiver temperature or the ejector outlet conditions

P_j = partial pressure of condensable (including HAP) at the receiver temperature or the ejector outlet conditions

La = total air leak rate in the system, mass/time

MW_{nc} = molecular weight of noncondensable gas

t = time of vacuum operation

discrepancy between the test value and the estimated value. An engineering assessment includes, but is not limited to, the following: [§63.1257(d)(2)(ii)]

- (1) Previous test results, provided the tests are representative of current operating practices at the process unit. [§63.1257(d)(2)(ii)(A)]
- (2) Bench-scale or pilot-scale test data representative of the process under representative operating conditions. [§63.1257(d)(2)(ii)(B)]
- (3) Maximum flow rate, HAP emission rate, concentration, or other relevant parameter specified or implied within a permit limit applicable to the process vent. [§63.1257(d)(2)(ii)(C)]
- (4) Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties. Examples of analytical methods include, but are not limited to: [§63.1257(d)(2)(ii)(D)]
 - (a) Use of material balances based on process stoichiometry to estimate maximum organic HAP concentrations. [§63.1257(d)(2)(ii)(D)(1)]
 - (b) Estimation of maximum flow rate based on physical equipment design such as pump or blower capacities. [§63.1257(d)(2)(ii)(D)(2)]
 - (c) Estimation of HAP concentrations based on saturation conditions. [§63.1257(d)(2)(ii)(D)(3)]
- (5) All data, assumptions, and procedures used in the engineering assessment shall be documented in accordance with §63.1260(e). Data or other information supporting a finding that the emissions estimation equations are inappropriate shall be reported in the Precompliance report. [§63.1257(d)(2)(ii)(E)]

- 3) *Initial compliance demonstration for process condensers.* During periods when the condenser is operating as a process condenser, the permittee is required to demonstrate that the process condenser is properly operated if the process condenser is not followed by an air pollution control device. . The permittee must either measure the condenser exhaust gas temperature and show it is less than the boiling or bubble point of the substance(s) in the vessel, or perform a material balance around the vessel and condenser to show that at least 99 percent of the material vaporized while boiling is condensed. The initial demonstration shall be conducted for all appropriate operating scenarios and documented in the Notification of Compliance Status report described in §63.1260(f). [§63.1257(d)(3)(iii)(B) & §63.1257(d)(3)(iii)(B)(1)]

Monitoring Requirements:

- 1) The permittee shall provide evidence of continued compliance with the standard. During the initial compliance demonstration, maximum or minimum operating parameter levels, as appropriate, shall be established for emission sources that will indicate the source is in compliance. Test data, calculations, or information from the evaluation of the control device design shall be used to establish the operating parameter level. [§63.1258(a)]
- 2) *Monitoring for emission limits.* The permittee of any affected source complying with the provisions of §63.1254(b)(2) shall demonstrate continuous compliance with the 900 kg/yr emission limit by calculating daily 365-day rolling summations of emissions. During periods of planned routine maintenance when emissions are controlled as specified in §63.1252(h), the permittee must calculate controlled emissions assuming the HAP emissions are reduced by 93 percent. [§63.1258(c)]
- 3) *Leak inspection provisions for vapor suppression equipment.* [§63.1258(h)]
 - a) Except as provided in §63.1258(h)(9) and (10), for each vapor collection system, closed-vent system, fixed roof, cover, or enclosure required to comply with §63.1258, the permittee shall comply with the requirements of §63.1258(h)(2) through (8). [§63.1258(h)(1)]
 - b) Except as provided in §63.1258(h)(6) and (7), each vapor collection system and closed-vent system shall be inspected according to the procedures and schedule specified in §63.1258(h)(2)(i) and (ii). [§63.1258(h)(2)]
 - i) If the vapor collection system or closed-vent system is constructed of hard-piping, the permittee shall: [§63.1258(h)(2)(i)]
 - (1) Conduct an initial inspection according to the procedures in §63.1258(h)(3) and; [§63.1258(h)(2)(i)(A)]
 - (2) Conduct annual visual inspections for visible, audible, or olfactory indications of leaks. [§63.1258(h)(2)(i)(B)]
 - ii) If the vapor collection system or closed-vent system is constructed of ductwork, the permittee shall: [§63.1258(h)(1)(ii)]
 - (1) Conduct an initial inspection according to the procedures in §63.1258(h)(3), and [§63.1258(h)(2)(ii)(A)]
 - (2) Conduct annual inspections according to the procedures in §63.1258(h)(3). [§63.1258(h)(1)(ii)(B)]

- (3) Conduct annual visual inspections for visible, audible, or olfactory indications of leaks.
[§63.1258(h)(2)(ii)(C)]
- c) Each vapor collection system and closed-vent system shall be inspected according to the procedures specified in §63.1258(h)(3)(i) through (v). [§63.1258(h)(3)]
 - i) Inspections shall be conducted in accordance with Method 21 of 40 CFR part 60, appendix A.
[§63.1258(h)(3)(i)]
 - ii) *Detection instrument performance criteria.* [§63.1258(h)(3)(ii)]
 - (1) Except as provided in §63.1258(h)(3)(ii)(B), the detection instrument shall meet the performance criteria of Method 21 of 40 CFR part 60, appendix A, except the instrument response factor criteria in section 3.1.2(a) of Method 21 shall be for the average composition of the process fluid not each individual VOC in the stream. For process streams that contain nitrogen, air, or other inerts, which are not organic HAP or VOC, the average stream response factor, shall be calculated on an inert-free basis.
[§63.1258(h)(3)(ii)(A)]
 - (2) If no instrument is available at the plant site that will meet the performance criteria specified in §63.1258(h)(3)(ii)(A), the instrument readings may be adjusted by multiplying by the average response factor of the process fluid, calculated on an inert-free basis as described in §63.1258(h)(3)(ii)(A).
[§63.1258(h)(3)(ii)(B)]
 - iii) The detection instrument shall be calibrated before use on each day of its use by the procedures specified in Method 21 of 40 CFR part 60, appendix A. [§63.1258(h)(3)(iii)]
 - iv) Calibration gases shall be as follows: [§63.1258(h)(3)(iv)]
 - (1) Zero air (less than 10 parts per million hydrocarbon in air), and [§63.1258(h)(3)(iv)(A)]
 - (2) Mixtures of methane in air at a concentration less than 10,000 parts per million. A calibration gas other than methane in air may be used if the instrument does not respond to methane or if the instrument does not meet the performance criteria specified in §63.1258(h)(2)(ii)(A). In such cases, the calibration gas may be a mixture of one or more of the compounds to be measured in air. [§63.1258(h)(3)(iv)(B)]
 - v) The permittee may elect to adjust or not adjust instrument readings for background. If the permittee elects to not adjust readings for background, all such instrument readings shall be compared directly to the applicable leak definition to determine whether there is a leak. If the permittee elects to adjust instrument readings for background, the permittee shall measure background concentration using the procedures in §63.180(b) and (c). The permittee shall subtract background reading from the maximum concentration indicated by the instrument. [§63.1258(h)(3)(v)]
 - vi) The background level shall be determined according to the procedures in Method 21 of 40 CFR part 60 appendix A. [§63.1258(h)(3)(vi)]
 - vii) The arithmetic difference between the maximum concentration indicated by the instrument and the background level shall be compared with 500 parts per million for determining compliance.
[§63.1258(h)(3)(vii)]
- d) Leaks, as indicated by an instrument reading greater than 500 parts per million above background or by visual inspections, shall be repaired as soon as practicable, except as provided in §63.1258(h)(5). [§63.1258(h)(4)]
 - i) A first attempt at repair shall be made no later than 5 calendar days after the leak is detected.
[§63.1258(h)(4)(i)]
 - ii) Repair shall be completed no later than 15 calendar days after the leak is detected, except as provided in §63.1258(h)(4)(iii). [§63.1258(h)(4)(ii)]
 - iii) For leaks found in vapor collection systems used for transfer operations, repairs shall be completed no later than 15 calendar days after the leak is detected or at the beginning of the next transfer loading operation, whichever is later. [§63.1258(h)(4)(iii)]
- e) Delay of repair of a vapor collection system and closed-vent system for which leaks have been detected is allowed if the repair is technically infeasible without a shutdown, as defined in §63.1251, or if the permittee determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next shutdown. [§63.1258(h)(5)]
- f) Any parts of the vapor collection system and closed-vent system that are designated, as described in §63.1258(h)(8), as unsafe to inspect are exempt from the inspection requirements of §63.1258(h)(2)(i), (ii), and (iii) if: [§63.1258(h)(6)]

- i) The permittee determines that the equipment is unsafe to inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with §63.1258 (h)(2)(i), (ii), or (iii), and [§63.1258(h)(6)(i)]
- ii) The permittee has a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times. [§63.1258(h)(6)(ii)]
- g) Any parts of the vapor collection system, closed-vent system, fixed roof, cover, or enclosure that are designated, as described in §63.1258(h)(8), as difficult to inspect are exempt from the inspection requirements of §63.1258(h)(2)(i), (ii), and (iii)(A) if: [§63.1258(h)(7)]
 - i) The permittee determines that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface, and [§63.1258(h)(7)(i)]
 - ii) The permittee has a written plan that requires inspection of the equipment at least once every 5 years. [§63.1258(h)(7)(ii)]
- h) If a closed-vent system subject to §63.1258 is also subject to the equipment leak provisions of §63.1255, the permittee shall comply with the provisions of §63.1255 and is exempt from the requirements. [§63.1258(h)(9)]
- i) Instead of complying with the provisions of §63.1258(h)(2) through (8), the permittee may design a closed-vent system to operate at a pressure below atmospheric pressure. The system shall be equipped with at least one pressure gauge or other pressure measurement device that can be read from a readily accessible location to verify that negative pressure is being maintained in the closed-vent system when the associated control device is operating. [§63.1258(h)(10)]
- 4) *Planned routine maintenance.* During periods of planned routine maintenance when organic HAP emissions are controlled as specified in §63.1252(h)(2), the permittee must monitor the condenser outlet gas temperature according to the procedures specified in §63.1258(b)(1)(iii). During periods of planned routine maintenance when HCl emissions are controlled as specified in §63.1252(h)(3), the permittee must monitor the pH of the scrubber effluent once per day. [§63.1258(i)]

Record Keeping:

- 1) Records shall be maintained as specified in §63.1259(i)(4) through (9). [§63.1258(h)(8)]
- 2) *Requirements of subpart A of Part 63.* The permittee shall comply with the record keeping requirements in subpart A of 40 CFR Part 63 as specified in Table 1 of Subpart GGG and in §63.1259(a)(1) through (5). [§63.1259(a)]
 - a) *Data retention.* The permittee shall keep copies of all records and reports required by Subpart GGG for at least 5 years, as specified in §63.10(b)(1). [§63.1259(a)(1)]
 - b) *Records of applicability determinations.* The permittee of a stationary source that is not subject to Subpart GGG shall keep a record of the applicability determination, as specified in §63.10(b)(3). [§63.1259(a)(2)]
 - c) *Startup, shutdown, and malfunction plan.* [§63.1259(a)(3)]
 - d) *Record keeping requirements for sources with continuous monitoring systems.* If the permittee elects to install a continuous monitoring system then the permittee shall maintain records specified in §63.10(c)(1) through (14). [§63.1259(a)(4)]
 - e) *Application for approval of construction or reconstruction.* The permittee shall comply with the provisions in §63.5 regarding construction and reconstruction, excluding the provisions specified in §63.5(d)(1)(ii)(H), (d)(2), and (d)(3)(ii). [§63.1259(a)(5)]
- 3) *Records of equipment operation.* The permittee must keep the following records up-to-date and readily accessible: [§63.1259(b)]
 - a) For purposes of compliance with the annual mass limits of §63.1254(b)(2), daily records of the rolling annual total emissions. [§63.1259(b)(4)]
 - b) Records of the following, as appropriate: [§63.1259(b)(5)]

For processes in compliance with the annual mass limits of §63.1254(a)(2), the following records are required: [§63.1259(b)(5)(ii)]

 - i) The number of batches per year for each batch process; [§63.1259(b)(5)(ii)(A)]
 - ii) The operating hours per year for continuous processes; [§63.1259(b)(5)(ii)(B)]
 - iii) Standard batch uncontrolled and controlled emissions for each process; [§63.1259(b)(5)(ii)(C)]
 - iv) Actual uncontrolled and controlled emissions for each nonstandard batch; [§63.1259(b)(5)(ii)(E)]
 - v) A record whether each batch operated was considered a standard batch. [§63.1259(b)(5)(ii)(F)]
 - c) A schedule or log of each operating scenario updated daily or, at a minimum, each time a different operating scenario is put into operation. [§63.1259(b)(8)]

- d) Description of worst-case operating conditions as required in §63.1257(b)(8). [§63.1259(b)(9)]
- e) Periods of planned routine maintenance as described in §§63.1252(h) and 63.1257(c)(5). [§63.1259(b)(10)]
- f) All maintenance performed on the air pollution control equipment. [§63.1259(b)(13)]
- 4) *Records of operating scenarios.* The permittee shall keep records of each operating scenario which demonstrates compliance with Subpart GGG. [§63.1259(c)]
- 5) *Records of inspections.* The permittee shall keep records specified in §63.1259(i)(4) through (9). [§63.1259(i)]
 - a) Records identifying all parts of the vapor collection system and closed-vent system that are designated as unsafe to inspect in accordance with §63.1258(h)(6), an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment. [§63.1259(i)(4)]
 - b) Records identifying all parts of the vapor collection system and closed-vent system that are designated as difficult to inspect in accordance with §63.1258(h)(7), an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment. [§63.1259(i)(5)]
 - c) For each vapor collection system or closed-vent system that contains bypass lines that could divert a vent stream away from the control device and to the atmosphere, the permittee shall keep a record of the information specified in either §63.1259(i)(6)(i) or (ii). [§63.1259(i)(6)]
 - i) Hourly records of whether the flow indicator specified under §63.1252(b)(1) was operating and whether a diversion was detected at any time during the hour, as well as records of the times and durations of all periods when the vent stream is diverted from the control device or the flow indicator is not operating. [§63.1259(i)(6)(i)]
 - ii) Where a seal mechanism is used to comply with §63.1252(b)(2), hourly records of flow are not required. In such cases, the permittee shall record that the monthly visual inspection of the seals or closure mechanisms has been done, and shall record the occurrence of all periods when the seal mechanism is broken, the bypass line valve position has changed, or the key for a lock-and-key type lock has been checked out, and records of any car-seal that has broken. [§63.1259(i)(6)(ii)]
 - d) For each inspection conducted in accordance with §63.1258(h)(2) and (3) during which a leak is detected, a record of the information specified in §63.1259(i)(7)(i) through (ix). [§63.1259(i)(7)]
 - i) Identification of the leaking equipment. [§63.1259(i)(7)(i)]
 - ii) The instrument identification numbers and operator name or initials, if the leak was detected using the procedures described in §63.1258(h)(3); or a record that the leak was detected by sensory observations. [§63.1259(i)(7)(ii)]
 - iii) The date the leak was detected and the date of the first attempt to repair the leak. [§63.1259(i)(7)(iii)]
 - iv) Maximum instrument reading measured by the method specified in §63.1258(h)(4) after the leak is successfully repaired or determined to be nonrepairable. [§63.1259(i)(7)(iv)]
 - v) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak. [§63.1259(i)(7)(v)]
 - vi) The name, initials, or other form of identification of the permittee (or designee) whose decision it was that repair could not be effected without a shutdown. [§63.1259(i)(7)(vi)]
 - vii) The expected date of successful repair of the leak if a leak is not repaired within 15 calendar days. [§63.1259(i)(7)(vii)]
 - viii) Dates of shutdowns that occur while the equipment is unrepaired. [§63.1259(i)(7)(viii)]
 - ix) The date of successful repair of the leak. [§63.1259(i)(7)(ix)]
 - e) For each inspection conducted in accordance with §63.1258(h)(3) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [§63.1259(i)(8)]
 - f) For each visual inspection conducted in accordance with §63.1258(h)(2)(i)(B) or (h)(2)(iii)(B) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [§63.1259(i)(9)]

Reporting:

- 1) The permittee shall comply with the reporting requirements of §63.1260(b) through (l), as applicable. Applicable reporting requirements of §§63.9 and 63.10 are also summarized in Table 1 of Subpart GGG. [§63.1260(a)]
- 2) *Initial notification.* The permittee shall submit the applicable initial notification in accordance with §63.9(b) or (d). [§63.1260(b)]

- 3) *Submission of Precompliance Report.* The Precompliance report was submitted by the permittee on April 19, 2002 and approved by the St. Louis City Air Pollution Control Program on July 16, 2002. The permittee has complied with this requirement.
- 4) *Notification of Compliance Status report.* The Notification of Compliance Status report required under §63.9 shall be submitted no later than 150 days after the compliance date and shall include: [§63.1260(f)]
 - a) The results of any applicability determinations, emission calculations, or analyses used to identify and quantify HAP emissions from the affected source. [§63.1260(f)(1)]
 - b) The results of emissions profiles, performance tests, engineering analyses, design evaluations, or calculations used to demonstrate compliance. For performance tests, results should include descriptions of sampling and analysis procedures and quality assurance procedures. [§63.1260(f)(2)]
 - c) Descriptions of monitoring devices, monitoring frequencies, and the values of monitored parameters established during the initial compliance determinations, including data and calculations to support the levels established. [§63.1260(f)(3)]
 - d) Listing of all operating scenarios. [§63.1260(f)(4)]
 - e) Descriptions of worst-case operating and/or testing conditions for control devices. [§63.1260(f)(5)]
 - f) Identification of emission points subject to overlapping requirements described in §63.1250(h) and the authority under which the permittee will comply. [§63.1260(f)(6)]
- 5) *Periodic reports.* The permittee shall prepare Periodic reports in accordance with §63.1260(g)(1) and (2) and submit them to the Administrator. [§63.1260(g)]
 - a) *Submittal schedule.* Except as provided in §63.1260(g)(1)(i), and (iii), the permittee shall submit Periodic reports semiannually. The first report shall be submitted no later than 240 days after the Notification of Compliance Status is due and shall cover the 6-month period beginning on the date the Notification of Compliance Status is due. Each subsequent Periodic report shall cover the 6-month period following the preceding period. [§63.1260(g)(1)]
 - i) When the Administrator determines on a case-by-case basis that more frequent reporting is necessary to accurately assess the compliance status of the affected source or; [§63.1260(g)(1)(i)]
 - ii) When a new operating scenario has been operated since the last report, in which case quarterly reports shall be submitted. [§63.1260(g)(1)(iii)]
 - b) *Content of Periodic report.* The permittee shall include the information in §63.1260(g)(2)(i) through (vii), as applicable. [§63.1260(g)(2)]
 - i) Each Periodic report must include the information in §63.10(e)(3)(vi)(A) through (I) and (K) through (M). [§63.1260(g)(2)(i)]
 - ii) For each inspection conducted in accordance with §63.1258(h)(2) or (3) during which a leak is detected, the records specified in §63.1259(i)(7) must be included in the next Periodic report. [§63.1260(g)(2)(iii)]
 - iii) For each vapor collection system or closed vent system with a bypass line subject to §63.1252(b)(1), records required under §63.1259(i)(6)(i) of all periods when the vent stream is diverted from the control device through a bypass line. For each vapor collection system or closed vent system with a bypass line subject to §63.1252(b)(2), records required under §63.1259(i)(6)(ii) of all periods in which the seal mechanism is broken, the bypass valve position has changed, or the key to unlock the bypass line valve was checked out. [§63.1260(g)(2)(iv)]
 - iv) The information in §63.1260(g)(2)(v)(A) through (D) shall be stated in the Periodic report, when applicable. [§63.1260(g)(2)(v)]
 - (1) No excess emissions. [§63.1260(g)(2)(v)(A)]
 - (2) No exceedances of a parameter. [§63.1260(g)(2)(v)(B)]
 - (3) No excursions. [§63.1260(g)(2)(v)(C)]
 - (4) No continuous monitoring system has been inoperative, out of control, repaired, or adjusted. [§63.1260(g)(2)(v)(D)]
 - v) Each new operating scenario, which has been operated since the time period, covered by the last Periodic report. For each new operating scenario, the permittee shall provide verification that the operating conditions for any associated control or treatment device have not been exceeded, and that any required calculations and engineering analyses have been performed. For the initial Periodic report, each operating scenario for each process operated since the due date of the Notification of Compliance Status Report shall be submitted. [§63.1260(g)(2)(vii)]
 - 6) *Notification of process change.* [§63.1260(h)]

- a) Except as specified in §63.1260(h)(2), whenever a process change is made, or a change in any of the information submitted in the Notification of Compliance Status Report, the permittee shall submit the information specified in §63.1260(h)(1)(i) through (iv) with the next Periodic report required under §63.1260(g). [§63.1260(h)(1)]
 - i) A brief description of the process change. [§63.1260(h)(1)(i)]
 - ii) A description of any modifications to standard procedures or quality assurance procedures. [§63.1260(h)(1)(ii)]
 - iii) Revisions to any of the information reported in the original Notification of Compliance Status Report under §63.1260(f). [§63.1260(h)(1)(iii)]
 - iv) Information required by the Notification of Compliance Status Report under §63.1260(f) for changes involving the addition of processes or equipment. [§63.1260(h)(1)(iv)]
 - b) The permittee must submit a report 60 days before the scheduled implementation date of either of the following: [§63.1260(h)(2)]
 - i) Any change in the activity covered by the Precompliance report. [§63.1260(h)(2)(i)]
 - ii) A change in the status of a control device from small to large. [§63.1260(h)(2)(ii)]
- 7) *Reports of startup, shutdown, and malfunction.* See Permit Condition EU0950-003 through EU1131-003. [§63.1260(i)]
- 8) *Notification of performance test and test plan.* The permittee shall notify the Administrator of the planned date of a performance test at least 60 days before the test in accordance with §63.7(b). The permittee also must submit the test plan required by §63.7(c) and the emission profile required by §63.1257(b)(8)(ii) with the notification of the performance test. [§63.1260(l)]
- 9) *Request for extension of compliance.* The permittee may submit to the Administrator a request for an extension of compliance in accordance with §63.1250(f)(4). [§63.1260(m)]

Permit Condition EU0950-007 through EU1131-007

10 CSR 10-6.075

Maximum Achievable Control Technology Regulations

40 CFR Part 63, Subpart GGG

National Emission Standards for Pharmaceutical Production – Process Equipment Leaks

Emission Limitation and Monitoring Requirements:

- 1) *General Equipment Leak Requirements* [§63.1255(a)]
- a) The provisions §63.1255 apply to pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, instrumentation systems, control devices, and closed-vent systems that are intended to operate in organic hazardous air pollutant service 300 hours or more during the calendar year within a source subject to the provisions of Subpart GGG. [§63.1255(a)(1)]
 - b) Equipment to which the general equipment leak requirements apply shall be identified such that it can be distinguished readily from equipment that is not subject to the requirements. Identification of the equipment does not require physical tagging of the equipment. For example, the equipment may be identified on a plant site plan, in log entries, or by designation of process boundaries by some form of weatherproof identification. If changes are made to the affected source subject to the leak detection requirements, equipment identification for each type of component shall be updated, if needed, within 90 calendar days or by the next Periodic Report following the end of the monitoring period for that component, whichever is later. [§63.1255(a)(7)]
 - c) When each leak is detected by visual, audible, or olfactory means, or by monitoring as described in §63.180(b) or (c), the following requirements apply: [§63.1255(a)(10)]
 - i) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment. [§63.1255(a)(10)(i)]
 - ii) The identification on a valve in light liquid or gas/vapor service may be removed after it has been monitored as specified in §63.1255(e)(7)(iii), and no leak has been detected during the follow-up monitoring. [§63.1255(a)(10)(ii)]
 - iii) The identification on equipment, except on a valve in light liquid or gas/vapor service, may be removed after it has been repaired. [§63.1255(a)(10)(iii)]

- d) Except as provided in §63.1255(a)(11)(i), all terms in Subpart GGG that define a period of time for completion of required tasks (e.g., weekly, monthly, quarterly, annual) refer to the standard calendar periods unless specified otherwise in the section or paragraph that imposes the requirement. [§63.1255(a)(11)]
 - i) If the initial compliance date does not coincide with the beginning of the standard calendar period, the permittee may elect to utilize a period beginning on the compliance date, or may elect to comply in accordance with the provisions of §63.1255(a)(11)(ii) or (iii). [§63.1255(a)(11)(i)]
 - ii) Time periods specified in Subpart GGG for completion of required tasks may be changed by mutual agreement between the permittee and the Administrator, as specified in subpart A of Part 63. For each time period that is changed by agreement, the revised period shall remain in effect until it is changed. A new request is not necessary for each recurring period. [§63.1255(a)(11)(ii)]
 - iii) Except as provided in §63.1255(a)(11)(i) or (ii), where the period specified for compliance is a standard calendar period, if the initial compliance date does not coincide with the beginning of the calendar period, compliance shall be required according to the schedule specified in §63.1255(a)(11)(iii)(A) or (B), as appropriate. [§63.1255(a)(11)(iii)]
 - (1) Compliance shall be required before the end of the standard calendar period within which the initial compliance date occurs if there remain at least 3 days for tasks that must be performed weekly, at least 2 weeks for tasks that must be performed monthly, at least 1 month for tasks that must be performed each quarter, or at least 3 months for tasks that must be performed annually or; [§63.1255(a)(11)(iii)(A)]
 - (2) In all other cases, compliance shall be required before the end of the first full standard calendar period after the period within which the initial compliance date occurs. [§63.1255(a)(11)(iii)(B)]
 - iv) In all instances where a provision of Subpart GGG requires completion of a task during each of multiple successive periods, the permittee may perform the required task at any time during each period, provided the task is conducted at a reasonable interval after completion of the task during the previous period. [§63.1255(a)(11)(iv)]
 - e) In all cases where the provisions of Subpart GGG require the permittee to repair leaks by a specified time after the leak is detected, it is a violation of §63.1255 to fail to take action to repair the leaks within the specified time. If action is taken to repair the leaks within the specified time, failure of that action to successfully repair the leak is not a violation of §63.1255. However, if the repairs are unsuccessful, a leak is detected and the permittee shall take further action as required by applicable provisions of §63.1255. [§63.1255(a)(12)]
- 2) *References.* [§63.1255(b)]
- a) The permittee shall comply with the following provisions of Subpart GGG instead of subpart H of Part 63, as specified in §63.1255(b)(2) through (4). The term "process unit" as used in subpart H of Part 63 shall be considered to be defined the same as "group of processes" for sources subject to Subpart GGG. The term "fuel gas system," as used in subpart H of Part 63, shall not apply for the purposes of Subpart GGG. [§63.1255(b)(1)]
 - b) Sections 63.160, 63.161, 63.162, 63.163, 63.167, 63.168, 63.170, 63.173, 63.175, 63.176, 63.181, and 63.182 shall not apply for the purposes of Subpart GGG. The permittee shall comply with the provisions specified below. [§63.1255(b)(2)]
 - i) For general leak requirements, the permittee shall comply with (§63.1255(a); [§63.1255(b)(2)(i)]
 - ii) For definitions, the permittee shall comply with §63.1251; [§63.1255(b)(2)(ii)]
 - iii) For pumps in light liquid service and for agitators in gas/vapor service and light liquid service the permittee shall comply with (§63.1255(c); [§63.1255(b)(2)(iii)]
 - iv) For open ended valves or lines the permittee shall comply with §63.1255(d); [§63.1255(b)(2)(iv)]
 - v) For valves in gas/vapor service and light liquid service the permittee shall comply with §63.1255(e); [§63.1255(b)(2)(v)]
 - vi) The permittee shall comply with the record keeping requirements of §63.1255(g), and [§63.1255(b)(2)(vii)]
 - vii) The permittee shall comply with the reporting requirements of §63.1255(h). [§63.1255(b)(2)(viii)]
 - c) The permittee shall comply with §§63.165, 63.169, 63.177, and 63.179 in their entirety, except that when these sections reference other sections of subpart H of Part 63, the references shall mean the sections specified in §63.1255(b)(2) and (4). §63.165 applies to pressure relief devices in gas/vapor service. §63.169 applies to pumps, valves, connectors, and agitators in heavy liquid service; instrumentation systems; and pressure relief devices in liquid service. §63.177 applies to general alternative means of emission limitation. §63.179 applies to alternative means of emission limitation for enclosed-vented process units. [§63.1255(b)(3)]

- d) The permittee shall comply with §§63.171, 63.172, 63.174, 63.178, and 63.180, except as specified in §63.1255(b)(4)(i) through (vi). [§63.1255(b)(4)]
 - i) §63.171 shall apply, except §63.171(a) shall not apply. Instead, delay of repair of equipment for which leaks have been detected is allowed if one of the conditions in §63.1255(b)(4)(i)(A) through (B) exists: [§63.1255(b)(4)(i)]
 - (1) The repair is technically infeasible without a process shutdown. Repair of this equipment shall occur by the end of the next scheduled process shutdown. [§63.1255(b)(4)(i)(A)]
 - (2) The permittee determines that repair personnel would be exposed to an immediate danger if attempting to repair without a process shutdown. Repair of this equipment shall occur by the end of the next scheduled process shutdown. [§63.1255(b)(4)(i)(B)]
 - ii) §63.172 shall apply for closed-vent systems used to comply with §63.1255, and for control devices used to comply with §63.1255 only, except: [§63.1255(b)(4)(ii)]
 - (1) §63.172(k) and (l) shall not apply. The permittee shall instead comply with §63.1255(f). [§63.1255(b)(4)(ii)(A)]
 - (2) Owners or operators may, instead of complying with the provisions of §63.172(f), design a closed-vent system to operate at a pressure below atmospheric pressure. The system shall be equipped with at least one pressure gage or other pressure measurement device that can be read from a readily accessible location to verify that negative pressure is being maintained in the closed-vent system when the associated control device is operating. [§63.1255(b)(4)(ii)(B)]
 - (3) The requirements apply at all times, except as specified in §63.1250(g). The permittee may not comply with the planned routine maintenance provisions in §63.1252(h). [§63.1255(b)(4)(ii)(C)]
 - iii) §63.174 shall apply except: [§63.1255(b)(4)(iii)]
 - (1) §63.174(f), (g), and (h) shall not apply. Instead of §63.174(f), (g), and (h), the permittee shall comply with §63.1255(f). §63.174(b)(3) shall not apply. Instead of §63.174(b)(3), the permittee shall comply with §63.1255(b)(4)(iii)(B) through (F). [§63.1255(b)(4)(iii)(A)]
 - (2) If the percent leaking connectors in a group of processes was greater than or equal to 0.5 percent during the initial monitoring period, monitoring shall be performed once per year until the percent leaking connectors is less than 0.5 percent. [§63.1255(b)(4)(iii)(B)]
 - (3) If the percent leaking connectors in the group of processes was less than 0.5 percent, but equal to or greater than 0.25 percent, during the initial or last required monitoring period, the permittee may elect to monitor once every 4 years. The permittee may comply with the requirements of this paragraph by monitoring at least 40 percent of the connectors in the first 2 years and the remainder of the connectors within the next 2 years. The percent leaking connectors will be calculated for the total of all required monitoring performed during the 4-year period. [§63.1255(b)(4)(iii)(C)]
 - (4) Except as provided in §63.1255(b)(4)(iii)(B), if leaking connectors comprise at least 0.5 percent but less than 1.0 percent of the connectors during the last monitoring period, the permittee shall monitor at least once every 2 years for the next monitoring period. At the end of that 2-year monitoring period, if the percent leaking connectors is greater than or equal to 0.5 percent, the permittee shall monitor once per year until the percent leaking connectors is less than 0.5 percent. If, at the end of a monitoring period, the percent leaking connectors is less than 0.5 percent, the permittee shall monitor in accordance with §63.1255(b)(4)(iii)(C) or (F), as appropriate. [§63.1255(b)(4)(iii)(D)]
 - (5) If the permittee determines that 1 percent or greater of the connectors in a group of processes are leaking, the permittee shall monitor the connectors once per year. The permittee may elect to use the provisions of §63.1255(b)(4)(iii)(C), (D), or (F), as appropriate, after a monitoring period in which less than 1 percent of the connectors are determined to be leaking. [§63.1255(b)(4)(iii)(E)]
 - (6) The permittee may elect to perform monitoring once every 8 years if the percent leaking connectors in the group of processes was less than 0.25 percent during the initial or last required monitoring period. The permittee shall monitor at least 50 percent of the connectors in the first 4 years and the remainder of the connectors within the next 4 years. If the percent leaking connectors in the first 4 years is equal to or greater than 0.35 percent, the monitoring program shall revert at that time to the appropriate monitoring frequency specified in §63.1255(b)(4)(iii)(C), (D), or (E). [§63.1255(b)(4)(iii)(F)]
 - iv) §63.178 shall apply except: [§63.1255(b)(4)(iv)]
 - (1) §63.178(b), requirements for pressure testing, may be applied to all processes (not just batch processes) and to supply lines between storage and processing areas. [§63.1255(b)(4)(iv)(A)]

- (2) For pumps, the phrase "at the frequencies specified in Table 1 of Subpart GGG" in §63.178(c)(3)(iii) shall mean "quarterly" for the purposes Subpart GGG. [§63.1255(b)(4)(iv)(B)]
- v) §63.180 shall apply except §63.180(b)(4)(ii)(A) through (C) shall not apply. Instead, calibration gases shall be a mixture of methane and air at a concentration of approximately, but less than, 10,000 parts per million methane for agitators; 2,000 parts per million for pumps; and 500 parts per million for all other equipment, except as provided in §63.180(b)(4)(iii). [§63.1255(b)(4)(v)]
- vi) When §§63.171, 63.172, 63.174, 63.178, and 63.180 reference other sections in subpart H of Part 63, the references shall mean those sections specified in §63.1255(b)(2) and (b)(4)(i) through (v), as applicable. [§63.1255(b)(4)(vi)]
- 3) *Standards for Pumps in Light Liquid Service and Agitators in Gas/Vapor Service and in Light Liquid Service.* [§63.1255(c)]
- a) The provisions of §63.1255 apply to each pump that is in light organic HAP liquid service, and to each agitator in organic HAP gas/vapor service or in light organic HAP liquid service. [§63.1255(c)(1)]
- b) *Monitoring, Leak Definition and Visual Inspections* [§63.1255(c)(2)]
- i) Each pump and agitator subject to §63.1255 shall be monitored quarterly to detect leaks by the Method 21 of 40 CFR Part 60, Appendix A in accordance with procedures established in 40 CFR §63.180(b) of subpart H except as provided in 40 CFR §§63.177, 63.178, §63.1255(f), and §63.1255(c)(5) through (9). [§63.1255(c)(2)(i)]
- ii) A leak is detected if an instrument reading of 10,000 parts per million or greater for agitators and 2,000 ppm or greater for pumps is measured. The instrument reading, as determined by the method as specified in §63.180(b), that defines a leak is: [§63.1255(c)(2)(ii)(A) and (B)]
- iii) *Visual Inspections.* Each pump and agitator shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump or agitator seal. If there are indications of liquids dripping from the pump or agitator seal at the time of the weekly inspection, the permittee shall follow the procedure specified in either §63.1255(c)(2)(iii)(A) or (B) prior to the next weekly inspection. [§63.1255(c)(2)(iii)]
- iv) The permittee shall monitor the pump or agitator by the method specified in §63.180(b). If the instrument reading indicates a leak as specified in §63.1255(c)(2)(ii), a leak is detected. [§63.1255(c)(2)(iii)(A)]
- v) The permittee shall eliminate the visual indications of liquids dripping. [§63.1255(c)(2)(iii)(B)]
- c) *Repair provisions.* [§63.1255(c)(3)]
- i) When a leak is detected pursuant to §63.1255(c)(2)(i), (c)(2)(iii)(A), (c)(5)(iv)(A), or (c)(5)(vi)(B), it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §63.1255(b)(4)(i). [§63.1255(c)(3)(i)]
- ii) Delay of repair of equipment for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the permittee determines that the repair personnel would be exposed to an immediate danger if attempting to repair without a process shutdown. Repair of such equipment shall occur by the end of the next scheduled process shutdown. [§63.1255(b)(4)(i)]
- iii) A first attempt at repair shall be made no later than 5 calendar days after the leak is detected. First attempts at repair include, but are not limited to, the following practices where practicable: [§63.1255(c)(3)(ii)]
- iv) Tightening of packing gland nuts. [§63.1255(c)(3)(ii)(A)]
- v) Ensuring that the seal flush is operating at design pressure and temperature. [§63.1255(c)(3)(ii)(b)]
- d) *Calculation of percent leakers.* [§63.1255(c)(4)]
- i) The permittee shall decide no later than the end of the first monitoring period what groups of processes will be developed. Once the permittee has decided, all subsequent percent calculations shall be made on the same basis. [§63.1255(c)(4)(i)]
- ii) If, calculated on a 1-year rolling average, the greater of either 10 percent or three of the pumps in a group of processes leak, the permittee shall monitor each pump once per month, until the calculated 1-year rolling average value drops below 10 percent or three pumps, as applicable. [§63.1255(c)(4)(ii)]
- iii) The number of pumps in a group of processes shall be the sum of all the pumps in organic HAP service, except that pumps found leaking in a continuous process within 1 quarter after startup of the pump shall not count in the percent leaking pumps calculation for that one monitoring period only. [§63.1255(c)(4)(iii)]
- iv) Percent leaking pumps shall be determined by the following Equation 3 of Subpart GGG: [§63.1255(c)(4)(iv)]

$$\%P_L = [(P_L - P_S)/(P_T - P_S)] \times 100 \quad (\text{Eq. 3})$$

Where:

$\%P_L$ = percent leaking pumps

P_L = number of pumps found leaking as determined through periodic monitoring as required in §63.1255(c)(2)(i) and (ii).

P_T = total pumps in organic HAP service, including those meeting the criteria in §63.1255(c)(5) and (6).

P_S = number of pumps in a continuous process leaking within 1 quarter of startup during the current monitoring period.

- e) *Exemptions.* Each pump or agitator equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of §63.1255(c)(1) through (c)(4)(iii), provided the following requirements are met: [§63.1255(c)(5)]
- i) Each dual mechanical seal system is: [§63.1255(c)(5)(i)]
 - (1) Operated with the barrier fluid at a pressure that is at all times greater than the pump/agitator stuffing box pressure or; [§63.1255(c)(5)(i)(A)]
 - (2) Equipped with a barrier fluid degassing reservoir that is connected by a closed-vent system to a control device that complies with the requirements of §63.1255(b)(4)(ii) or; [§63.1255(c)(5)(i)(B)]
 - (3) Equipped with a closed-loop system that purges the barrier fluid into a process stream. [§63.1255(c)(5)(i)(C)]
 - ii) The barrier fluid is not in light liquid service. [§63.1255(c)(5)(ii)]
 - iii) Each barrier fluid system is equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both. [§63.1255(c)(5)(iii)]
 - iv) Each pump/agitator is checked by visual inspection each calendar week for indications of liquids dripping from the pump/agitator seal. If there are indications of liquids dripping from the pump or agitator seal at the time of the weekly inspection, the permittee shall follow the procedures specified in either §63.1255(c)(5)(iv)(A) or (B) prior to the next required inspection. [§63.1255(c)(5)(iv)]
 - (1) The permittee shall monitor the pump or agitator using Method 21 in accordance with the procedures specified in 40 CFR §63.180(b) of subpart H to determine if there is a leak of organic HAP in the barrier fluid. If the instrument reading indicates a leak, if an instrument reading of 10,000 parts per million or greater for agitators and 2,000 parts per million or greater for pumps is measured, as specified in §63.1255(c)(2)(ii), a leak is detected. [§63.1255(c)(5)(iv)(A)]
 - (2) The permittee shall eliminate the visual indications of liquids dripping. [§63.1255(c)(5)(iv)(B)]
 - v) Each sensor as described in §63.1255(c)(5)(iii) is observed daily or is equipped with an alarm unless the pump is located within the boundary of an unmanned plant site. [§63.1255(c)(5)(v)]
 - vi) The permittee determines, based on design considerations and operating experience, criteria applicable to the presence and frequency of drips and to the sensor that indicate failure of the seal system, the barrier fluid system, or both. If indications of liquids dripping from the pump/agitator seal exceed the criteria established above, or if, based on the criteria established above, the sensor indicates failure of the seal system, the barrier fluid system, or both, a leak is detected. [§63.1255(c)(5)(vi)(A) and (B)]
 - vii) When a leak is detected pursuant to §63.1255(c)(5)(iv)(A) or (B), the leak must be repaired as specified in §63.1255(c)(3). [§63.1255(c)(5)(vii)]
 - f) Any pump/agitator that is designed with no externally actuated shaft penetrating the pump/agitator housing is exempt from the requirements of §63.1255(c)(1) through (3). [§63.1255(c)(6)]
 - g) Any pump/agitator equipped with a closed-vent system capable of capturing and transporting any leakage from the seal or seals back to the process or to a control device that complies with the requirements of §63.1255(b)(4)(ii) is exempt from the requirements of §63.1255(c)(2) through (5). [§63.1255(c)(7)]
 - h) Any pump/agitator that is located within the boundary of an unmanned plant site is exempt from the weekly visual inspection requirement of §63.1255(c)(2)(iii) and (c)(5)(iv), and the daily requirements of §63.1255(c)(5)(v), provided that each pump/agitator is visually inspected as often as practicable and at least monthly. [§63.1255(c)(8)]
 - i) If more than 90 percent of the pumps in a group of processes meet the criteria in either §63.1255(c)(5) or (6), the group of processes is exempt from the requirements of §63.1255(c)(4). [§63.1255(c)(9)]

4) *Standards: Open-Ended Valves or Lines.* [§63.1255(d)]

- a) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in §63.177 and §63.1255(d)(4) through (6). The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line, or during maintenance or repair. The cap, blind flange, plug, or second valve shall be in place within 1 hour of cessation of operations requiring process fluid flow through the open-ended valve or line, or within 1 hour of cessation of maintenance or repair. The permittee is not required to keep a record documenting compliance with the 1-hour requirement. [§63.1255(d)(1)(i) and (ii)]
- b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed. [§63.1255(d)(2)]
- c) When a double block and bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with §63.1255(d)(1) at all other times. [§63.1255(d)(3)]
- d) Open-ended valves or lines in an emergency shutdown system which are designed to open automatically in the event of a process upset are exempt from the requirements of §63.1255(d)(1) through (d)(3). [§63.1255(d)(4)]
- e) Open-ended valves or lines containing materials which would autocatalytically polymerize are exempt from the requirements of §63.1255(d)(1) through (d)(3). [§63.1255(d)(5)]
- f) Open-ended valves or lines containing materials which could cause an explosion, serious overpressure, or other safety hazard if capped or equipped with a double block and bleed system as specified in §63.1255(d)(1) through (d)(3) are exempt from the requirements of §63.1255(d)(1) through (d)(3). [§63.1255(d)(6)]

5) *Standards: Valves in Gas/Vapor Service and in Light Liquid Service.* [§63.1255(e)]

The provisions of 40 CFR 63.1255 of Subpart GGG apply to valves that are either in gas organic HAP service or in light liquid organic HAP service. A valve in gas/vapor service is a valve in organic hazardous air pollutant service containing a gas or vapor at operating conditions. A valve in light liquid service is a valve that is in organic hazardous air pollutant service and which contains a liquid at operating conditions with one or more organic compounds with a vapor pressure greater than 0.3 kilopascals at 20 °C determined by the methods described in 40 CFR 60.485(e)(1) and the total concentration of the pure organic compounds constituents having 0.3 kilopascals at 20 °C is equal to or greater than 20 percent by weight of the total process stream. [40 CFR 63.1251 – Definitions, & 63.1255(e)(1)]

- a) For existing and new affected sources, all valves subject to §63.1255 shall be monitored, except as provided in §63.1255(f) and in §63.177, by no later than 1 year after the compliance date. [§63.1255(e)(2)]
- b) *Monitoring.* The permittee shall monitor all valves, except as provided in §63.1255(f) and in §63.177, at the intervals specified in §63.1255(e)(4) and shall comply with all other provisions, except as provided in §63.1255(b)(4)(i), §§ 63.178 and 63.179. [§63.1255(e)(3)]
 - i) The valves shall be monitored to detect leaks by Method 21 in accordance with the procedures specified in 40 CFR §63.180(b) of subpart H. [§63.1255(e)(3)(i)]
 - ii) An instrument reading of 500 parts per million or greater defines a leak. [§63.1255(e)(3)(ii)]
- c) *Subsequent monitoring frequencies.* After conducting the initial survey required in §63.1255(e)(2), the permittee shall monitor valves for leaks at the intervals specified below: [§63.1255(e)(4)]
 - i) For a group of processes with 2 percent or greater leaking valves, calculated according to §63.1255(e)(6), the permittee shall monitor each valve once per month, except as specified in §63.1255(e)(9). [§63.1255(e)(4)(i)]
 - ii) For a group of processes with less than 2 percent leaking valves, the permittee shall monitor each valve once each quarter, except as provided in §63.1255(e)(4)(iii) through (e)(4)(v). [§63.1255(e)(4)(ii)]
 - iii) For a group of processes with less than 1 percent leaking valves, the permittee may elect to monitor each valve once every 2 quarters. [§63.1255(e)(4)(iii)]
 - iv) For a group of processes with less than 0.5 percent leaking valves, the permittee may elect to monitor each valve once every 4 quarters. [§63.1255(e)(4)(iv)]
 - v) For a group of processes with less than 0.25 percent leaking valves, the permittee may elect to monitor each valve once every 2 years. [§63.1255(e)(4)(v)]
- d) *Calculation of percent leakers.* For a group of processes to which Subpart GGG applies, the permittee may choose to subdivide the valves in the applicable group of processes and apply the provisions of §63.1255(e)(4) to each subgroup. If the permittee elects to subdivide the valves in the applicable group of processes, then the provisions of §63.1255(e)(5)(i) through (e)(5)(viii) apply. (record keeping and reporting provisions under

§63.1255(e)(5)(iv) through (vii) are listed in the Record Keeping and Reporting sections, respectively).

[§63.1255(e)(5)]

- i) The overall performance of total valves in the applicable group of processes must be less than 2 percent leaking valves, as detected according to §63.1255(e)(3)(i) and (ii) and as calculated according to §63.1255(e)(6) (ii) and (iii). [§63.1255(e)(5)(i)]
- ii) The initial assignment or subsequent reassignment of valves to subgroups shall be governed by the provisions of §63.1255(e)(5)(ii) (A) through (C). [§63.1255(e)(5)(ii)]
 - (1) The permittee shall determine which valves are assigned to each subgroup. Valves with less than 1 year of monitoring data or valves not monitored within the last 12 months must be placed initially into the most frequently monitored subgroup until at least 1 year of monitoring data has been obtained. [§63.1255(e)(5)(ii)(A)]
 - (2) Any valve or group of valves can be reassigned from a less frequently monitored subgroup to a more frequently monitored subgroup provided that the valves to be reassigned were monitored during the most recent monitoring period for the less frequently monitored subgroup. The monitoring results must be included with the less frequently monitored subgroup's monitoring event and associated next percent leaking valves calculation for that group. [§63.1255(e)(5)(ii)(B)]
 - (3) Any valve or group of valves can be reassigned from a more frequently monitored subgroup to a less frequently monitored subgroup provided that the valves to be reassigned have not leaked for the period of the less frequently monitored subgroup (e.g., for the last 12 months, if the valve or group of valves is to be reassigned to a subgroup being monitored annually). Nonrepairable valves may not be reassigned to a less frequently monitored subgroup. [§63.1255(e)(5)(ii)(C)]
- iii) The permittee shall determine every 6 months if the overall performance of total valves in the applicable group of processes is less than 2 percent leaking valves and so indicate the performance in the next periodic report. If the overall performance of total valves in the applicable group of processes is 2 percent leaking valves or greater, the permittee shall revert to the program required in §63.1255(e)(2) through (e)(4). The overall performance of total valves in the applicable group of processes shall be calculated as a weighted average of the percent leaking valves of each subgroup according to the following Equation 4 of Subpart GGG: (§63.1255(e)(5)(iii))

$$\%V_{LO} = \frac{\sum_{i=1}^n (\%V_{Li} \times V_i)}{\sum_{i=1}^n V_i} \quad (Eq. 4)$$

where:

$\%V_{LO}$ = overall performance of total valves in the applicable process or group of processes

$\%V_{Li}$ = percent leaking valves in subgroup i, most recent value calculated according to the procedures in §63.1255(e)(6)(ii) and (iii).

V_i = number of valves in subgroup i

- iv) To determine the monitoring frequency for each subgroup, the calculation procedures of §63.1255(e)(6)(iii) shall be used. [§63.1255(e)(5)(vii)]
- v) Except for the overall performance calculations required by §63.1255(e)(5)(i) and (e)(5)(iii), each subgroup shall be treated as if it were a process for the purposes of applying the provisions of §63.1255. [§63.1255(e)(5)(viii)]
- e) The permittee shall decide no later than the implementation date of Subpart GGG or upon revision of an operating permit how to group the processes. Once the permittee has decided, all subsequent percentage calculations shall be made on the same basis. Percent leaking valves for each group of processes or subgroup shall be determined by the following Equation 5 of Subpart GGG: (§63.1255(e)(6)(i) and (ii))

$$\%V_L = [V_L/V_T] \times 100 \quad (Eq. 5)$$

Where:

$\%V_L$ = percent leaking valves as determined through periodic monitoring required in §63.1255(e)(2) through (4).

V_T = total valves monitored, in a monitoring period excluding valves monitored as required by §63.1255(e)(7)(iii).

- i) When determining monitoring frequency for each group of processes or subgroup subject to monthly, quarterly, or semiannual monitoring frequencies, the percent leaking valves shall be the arithmetic average of the percent leaking valves from the last two monitoring periods. When determining monitoring frequency for each group of processes or subgroup subject to annual or biennial (once every 2 years) monitoring frequencies, the percent leaking valves shall be the arithmetic average of the percent leaking valves from the last three monitoring periods. [§63.1255(e)(6)(iii)]
- ii) (A) Nonrepairable valves shall be included in the calculation of percent leaking valves the first time the valve is identified as leaking and nonrepairable and as required to comply with §63.1255(e)(6)(iv)(B). Otherwise, a number of nonrepairable valves (identified and included in the percent leaking calculation in a previous period) up to a maximum of 1 percent of the total number of valves in organic HAP service at a process may be excluded from calculation of percent leaking valves for subsequent monitoring periods. (B) If the number of nonrepairable valves exceeds 1 percent of the total number of valves in organic HAP service at a process, the number of nonrepairable valves exceeding 1 percent of the total number of valves in organic HAP service shall be included in the calculation of percent leaking valves. [§63.1255(e)(6)(iv)(A) and (B)]
- f) *Repair provisions.* [§63.1255(e)(7)]
 - i) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in §63.1255(b)(4)(i)) stated below. [§63.1255(e)(7)(i)]
 - (1) The repair is technically infeasible without a process shutdown. Repair of this equipment shall occur by the end of the next scheduled process shutdown. [§63.1255(b)(4)(i)(A)]
 - (2) The permittee determines that repair personnel would be exposed to an immediate danger if attempting to repair without a process shutdown. Repair of this equipment shall occur by the end of the next scheduled process shutdown. [§63.1255(b)(4)(i)(B)]
 - ii) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. [§63.1255(e)(7)(ii)]
 - iii) When a leak is repaired, the valve shall be monitored at least once within the first 3 months after its repair. Days that the valve is not in organic HAP service shall not be considered part of this 3 month period. The monitoring required by this paragraph is in addition to the monitoring required to satisfy the definitions of "repaired" and "first attempt at repair." [§63.1255(e)(7)(iii)]
 - (1) The monitoring shall be conducted as specified in §63.180(b) and (c) as appropriate to determine whether the valve has resumed leaking. [§63.1255(e)(7)(iii)(A)]
 - (2) Periodic monitoring required by §63.1255(e)(2) through (4) may be used to satisfy the requirements of §63.1255(e)(7)(iii), if the timing of the monitoring period coincides with the time specified in §63.1255(e)(7)(iii). Alternatively, other monitoring may be performed to satisfy the requirements of §63.1255(e)(7)(iii), regardless of whether the timing of the monitoring period for periodic monitoring coincides with the time specified in §63.1255(e)(7)(iii). [§63.1255(e)(7)(iii)(B)]
 - (3) If a leak is detected by monitoring that is conducted pursuant to §63.1255(e)(7)(iii), the permittee shall follow the provisions of §63.1255(e)(7)(iii)(C)(1) and (2) to determine whether that valve must be counted as a leaking valve for purposes of §63.1255(e)(6). [§63.1255(e)(7)(iii)(C)]
 - (a) If the permittee elects to use periodic monitoring required by §63.1255(e)(2) through (4) to satisfy the requirements of §63.1255(e)(7)(iii), then the valve shall be counted as a leaking valve. [§63.1255(e)(7)(iii)(C)(1)]
 - (b) If the permittee elects to use other monitoring prior to the periodic monitoring required by §63.1255(e)(2) through (4) to satisfy the requirements of §63.1255(e)(7)(iii), then the valve shall be counted as a leaking valve unless it is repaired and shown by periodic monitoring not to be leaking. [§63.1255(e)(7)(iii)(C)(2)]
- g) First attempts at repair include, but are not limited to, the following practices where practicable: [§63.1255(e)(8)]
 - i) Tightening of bonnet bolts, [§63.1255(e)(8)(i)]
 - ii) Replacement of bonnet bolts, [§63.1255(e)(8)(ii)]
 - iii) Tightening of packing gland nuts, and [§63.1255(e)(8)(iii)]
 - iv) Injection of lubricant into lubricated packing. [§63.1255(e)(8)(iv)]

- h) Any equipment located at a plant site with fewer than 250 valves in organic HAP service in the affected source is exempt from the requirements for monthly monitoring specified in §63.1255(e)(4)(i). Instead, the permittee shall monitor each valve in organic HAP service for leaks once each quarter, or comply with §63.1255(e)(4)(iii), (iv), or (v), except as provided in §63.1255(f). [§63.1255(e)(9)]
- 6) *Unsafe to monitor/inspect, difficult to monitor/inspect, and inaccessible equipment.* [§63.1255(f)]
 - a) Equipment that is designated as unsafe to monitor, unsafe to inspect, difficult to monitor, difficult to inspect, or inaccessible is exempt from the monitoring requirements as specified in §63.1255(f)(1)(i) through (iv) provided the permittee meets the requirements specified in §63.1255(f)(2), (3), or (4), as applicable. All equipment must be assigned to a group of processes. Ceramic or ceramic-lined connectors are subject to the same requirements as inaccessible connectors. [§63.1255(f)(1)]
 - i) For pumps and agitators, §63.1255(c)(2), (3), and (4) do not apply. [§63.1255(f)(1)(i)]
 - ii) For valves, §63.1255(e)(2) through (7) do not apply. [§63.1255(f)(1)(ii)]
 - iii) For connectors, §63.174(b) through (e) and §63.1255(b)(4)(iii)(B) through (F) do not apply. [§63.1255(f)(1)(iii)]
 - iv) For closed-vent systems, §63.172(f)(1) and (2) and §63.172(g) do not apply. [§63.1255(f)(1)(iv)]
 - b) *Equipment that is unsafe to monitor or unsafe to inspect.* [§63.1255(f)(2)]
 - i) Valves, connectors, agitators, and pumps may be designated as unsafe to monitor if the permittee determines that monitoring personnel would be exposed to an immediate danger as a consequence of complying with the monitoring requirements referred to in §63.1255(f)(1)(i) through (iii). [§63.1255(f)(2)(i)]
 - ii) Any part of a closed-vent system may be designated as unsafe to inspect if the permittee determines that monitoring personnel would be exposed to an immediate danger as a consequence of complying with the monitoring requirements referred to in §63.1255(f)(1)(iv). [§63.1255(f)(2)(ii)]
 - iii) The permittee of equipment that is designated as unsafe to monitor must have a written plan that requires monitoring of the equipment as frequently as practicable during safe to monitor times, but not more frequently than the periodic monitoring schedule otherwise applicable to the group of processes in which the equipment is located. [§63.1255(f)(2)(iii)]
 - iv) For any parts of a closed-vent system designated as unsafe to inspect, the permittee must have a written plan that requires inspection of the closed-vent systems as frequently as practicable during safe to inspect times, but not more frequently than annually. [§63.1255(f)(2)(iv)]
 - c) *Equipment that is difficult to monitor or difficult to inspect.* [§63.1255(f)(3)]
 - i) A valve, agitator, or pump may be designated as difficult to monitor if the permittee determines that the valve, agitator, or pump cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface, or it is not accessible in a safe manner when it is in organic HAP service. [§63.1255(f)(3)(i)]
 - ii) Any part of a closed-vent system may be designated as difficult to inspect if the permittee determines that the equipment cannot be inspected without elevating the monitoring personnel more than 2 meters above a support surface, or it is not accessible in a safe manner when it is in organic HAP service. [§63.1255(f)(3)(ii)]
 - iii) At an existing source, any valve, agitator or pump within a group of processes that meets the criteria of §63.1255(f)(3)(i) may be designated as difficult to monitor, and any parts of a closed-vent system that meet the requirements of §63.1255(f)(3)(ii) may be designated as difficult to inspect. At a new affected source, the permittee may designate no more than 3 percent of valves as difficult to monitor. [§63.1255(f)(3)(iii)]
 - iv) The valves, agitators, or pumps designated as difficult to monitor must have a written plan that requires monitoring of the equipment at least once per calendar year or on the periodic monitoring schedule otherwise applicable to the group of processes in which the equipment is located, whichever is less frequent. For any part of a closed-vent system designated as difficult to inspect, the permittee must have a written plan that requires inspection of the closed-vent system at least once every 5 years. [§63.1255(f)(3)(iv)]
 - d) *Inaccessible, ceramic, or ceramic-lined connectors.* [§63.1255(f)(4)]
 - i) A connector may be designated as inaccessible if it is: [§63.1255(f)(4)(i)]
 - (1) Buried; [§63.1255(f)(4)(i)(A)]
 - (2) Insulated in a manner that prevents access to the connector by a monitor probe; [§63.1255(f)(4)(i)(B)]
 - (3) Obstructed by equipment or piping that prevents access to the connector by a monitor probe; [§63.1255(f)(4)(i)(C)]

- (4) Unable to be reached from a wheeled scissor-lift or hydraulic-type scaffold which would allow access to equipment up to 7.6 meters (25 feet) above the ground; or [§63.1255(f)(4)(i)(D)]
- (5) Not able to be accessed at any time in a safe manner to perform monitoring. Unsafe access includes, but is not limited to, the use of a wheeled scissor-lift on unstable or uneven terrain, the use of a motorized man-lift basket in areas where an ignition potential exists, or access would require near proximity to hazards such as electrical lines, or would risk damage to equipment. [§63.1255(f)(4)(i)(E)]
- ii) A connector may be designated as inaccessible if it would require elevating the monitoring personnel more than 2 meters above a permanent support surface or would require the erection of scaffold. [§63.1255(f)(4)(ii)]
- iii) At an existing source, any connector that meets the criteria of §63.1255(f)(4)(i) or (ii) may be designated as inaccessible. At a new affected source, the permittee may designate no more than 3 percent of connectors as inaccessible. [§63.1255(f)(4)(iii)]
- iv) If any inaccessible, ceramic, or ceramic-lined connector is observed by visual, audible, olfactory, or other means to be leaking, the leak shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in §63.1255(b)(4)(i). [§63.1255(f)(4)(iv)]
- v) Any connector that is inaccessible or that is ceramic or ceramic-lined is exempt from the record keeping and reporting requirements of §63.1255(g) and (h). [§63.1255(f)(4)(v)]

Record Keeping:

- 1) *Records of equipment leak detection and repair programs.* The permittee implementing the leak detection and repair (LDAR) program specified in §63.1255 of Subpart GGG, shall implement the record keeping requirements in §63.1255. [§63.1259(d)]
- 2) The following record keeping requirements apply under §63.1255(g): [§63.1255(g)]
 - a) The permittee of more than one group of processes subject to the provisions of §63.1255 may comply with the record keeping requirements for the groups of processes in one record keeping system if the system identifies with each record the program being implemented (e.g., quarterly monitoring) for each type of equipment. All records and information required by §63.1255 shall be maintained in a manner that can be readily accessed at the plant site. This could include physically locating the records at the plant site or accessing the records from a central location by computer at the plant site. [§63.1255(g)(1)]
 - b) *General record keeping.* Except as provided in §63.1255(g)(5)(i) and in §63.1255(a)(9), the following information pertaining to all equipment subject to the requirements in §63.1255 shall be recorded: [§63.1255(g)(2)]
 - i) The following apply:
 - (1) A list of identification numbers for equipment (except connectors that are subject to §63.1255(f)(4)) subject to the requirements of §63.1255. Except for equipment subject to the record keeping requirements in §63.1255(g)(2)(ii) through (viii), equipment need not be individually identified if, for a particular type of equipment, all items of that equipment in a designated area or length of pipe subject to the provisions of §63.1255 are identified as a group, and the number of subject items of equipment is indicated. The list for each type of equipment shall be completed no later than the completion of the initial survey required for that component. The list of identification numbers shall be updated, if needed, to incorporate equipment changes identified during the course of each monitoring period within 90 calendar days, or by the next Periodic Report, following the end of the monitoring period for the type of equipment component monitored, whichever is later. [§63.1255(g)(2)(i)(A)]
 - (2) A schedule for monitoring connectors subject to the provisions of §63.174(a) and valves subject to the provisions of §63.1255(e)(4). [§63.1255(g)(2)(i)(B)]
 - (3) Physical tagging of the equipment to indicate that it is in organic HAP service is not required. Equipment subject to the provisions of §63.1255 may be identified on a plant site plan, in log entries, or by other appropriate methods. [§63.1255(g)(2)(i)(C)]
 - ii) The following apply:
 - (1) A list of identification numbers for equipment that the permittee elects to equip with a closed-vent system and control device, under the provisions of §63.1255(c)(7), §63.164(h), or §63.165(c). [§63.1255(g)(2)(ii)(A)]

- (2) A list of identification numbers for compressors that the permittee elects to designate as operating with an instrument reading of less than 500 parts per million above background, under the provisions of §63.164(i). [§63.1255(g)(2)(ii)(B)]
- iii) The following requirements apply:
 - (1) A list of identification numbers for pressure relief devices subject to the provisions in §63.165(a). [§63.1255(g)(2)(iii)(A)]
 - (2) A list of identification numbers for pressure relief devices equipped with rupture disks, under the provisions of §63.165(d). [§63.1255(g)(2)(iii)(B)]
- iv) Identification of instrumentation systems subject to the provisions of §63.1255. Individual components in an instrumentation system need not be identified. [§63.1255(g)(2)(iv)]
- v) The following information shall be recorded for each dual mechanical seal system: [§63.1255(g)(2)(v)]
 - (1) Design criteria required by §63.1255(c)(5)(vi)(A) and §63.164(e)(2), and an explanation of the design criteria; and [§63.1255(g)(2)(v)(A)]
 - (2) Any changes to these criteria and the reasons for the changes. [§63.1255(g)(2)(v)(B)]
- vi) A list of equipment designated as unsafe to monitor/inspect or difficult to monitor/inspect under §63.1255(f) and a copy of the plan for monitoring or inspecting this equipment. [§63.1255(g)(2)(vi)]
- vii) A list of connectors removed from and added to the process, as described in §63.174(i)(1), and documentation of the integrity of the weld for any removed connectors, as required in §63.174(j). This is not required unless the net credits for removed connectors is expected to be used. [§63.1255(g)(2)(vii)]
- viii) For equipment that the permittee elects to monitor as provided under §63.178(c), a list of equipment added to batch product processes since the last monitoring period required in §63.178(c)(3)(ii) and (iii). This list must be completed for each type of equipment within 90 calendar days, or by the next Periodic Report, following the end of the monitoring period for the type of equipment monitored, whichever is later. Also, if the permittee elects to adjust monitoring frequency by the time in use, as provided in §63.178(c)(3)(iii), records demonstrating the proportion of the time during the calendar year the equipment is in use in a manner subject to the provisions of §63.1255 are required. Examples of suitable documentation are records of time in use for individual pieces of equipment or average time in use for the process unit. [§63.1255(g)(2)(viii)]
- c) *Records of visual inspections.* For visual inspections of equipment subject to the provisions of §63.1255(c)(2)(iii) and (c)(5)(iv), the permittee shall document that the inspection was conducted and the date of the inspection. The permittee shall maintain records as specified in §63.1255(g)(4) for leaking equipment identified in this inspection, except as provided in §63.1255(g)(5). These records shall be retained for 2 years. [§63.1255(g)(3)]
- d) *Monitoring records.* When each leak is detected as specified in §63.1255(c) and §63.164, §63.1255(e) and §63.169, and §§63.172 and 63.174, the following information shall be recorded and kept for 5 years (at least 2 years onsite, with the remaining 3 years either onsite or offsite): [§63.1255(g)(4)]
 - i) The instrument and the equipment identification number and the operator name, initials, or identification number. [§63.1255(g)(4)(i)]
 - ii) The date the leak was detected and the date of the first attempt to repair the leak. [§63.1255(g)(4)(ii)]
 - iii) The date of successful repair of the leak. [§63.1255(g)(4)(iii)]
 - iv) The maximum instrument reading measured by Method 21 of 40 CFR part 60, appendix A, after the leak is successfully repaired or determined to be nonrepairable. [§63.1255(g)(4)(iv)]
 - v) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak. [§63.1255(g)(4)(v)]
 - (1) The permittee may develop a written procedure that identifies the conditions that justify a delay of repair. The written procedures shall be included either as part of the startup/shutdown/malfunction plan, required by §63.1259(a)(3), or in a separate document that is maintained at the plant site. Reasons for delay of repair may be documented by citing the relevant sections of the written procedure. [§63.1255(g)(4)(v)(A)]
 - (2) If delay of repair was caused by depletion of stocked parts, there must be documentation that the spare parts were sufficiently stocked onsite before depletion and the reason for depletion. [§63.1255(g)(4)(v)(B)]
- vi) If repairs were delayed, dates of process shutdowns that occur while the equipment is unrepaired. [§63.1255(g)(4)(vi)]
- vii) If the alternative in §63.174(c)(1)(ii) is not in use for the monitoring period, identification, either by list, location (area or grouping), or tagging of connectors disturbed since the last monitoring period required in

- §63.174(b), as described in §63.174(c)(1); the date and results of follow-up monitoring as required in §63.174(c)(1)(i) and (c)(2)(ii). If identification of disturbed connectors is made by location, then all connectors within the designated location shall be monitored. [§63.1255(g)(4)(vii)(A) and (B)]
- viii) The date and results of the monitoring required in §63.178(c)(3)(i) for equipment added to a batch process since the last monitoring period required in §63.178(c)(3)(ii) and (iii). If no leaking equipment is found in this monitoring, the permittee shall record that the inspection was performed. Records of the actual monitoring results are not required. [§63.1255(g)(4)(viii)]
- ix) Copies of the periodic reports as specified in §63.1255(h)(3), if records are not maintained on a computerized data base capable of generating summary reports from the records. [§63.1255(g)(4)(ix)]
- e) *Records of pressure tests.* The permittee who elects to pressure test a process equipment train or supply lines between storage and processing areas to demonstrate compliance with §63.1255 is exempt from the requirements of §63.1255(g)(2), (3), (4), and (6). Instead, the permittee shall maintain records of the following information: [§63.1255(g)(5)]
- i) The identification of each product, or product code, produced during the calendar year. It is not necessary to identify individual items of equipment in the process equipment train. [§63.1255(g)(5)(i)]
- ii) Physical tagging of the equipment to identify that it is in organic HAP service and subject to the provisions of §63.1255 is not required. Equipment in a process subject to the provisions of §63.1255 may be identified on a plant site plan, in log entries, or by other appropriate methods. [§63.1255(g)(5)(ii)]
- iii) The dates of each pressure test required in §63.178(b), the test pressure, and the pressure drop observed during the test. [§63.1255(g)(5)(iii)]
- iv) Records of any visible, audible, or olfactory evidence of fluid loss. [§63.1255(g)(5)(iv)]
- v) When a process equipment train does not pass two consecutive pressure tests, the following information shall be recorded in a log and kept for 2 years: [§63.1255(g)(5)(v)]
- (1) The date of each pressure test and the date of each leak repair attempt. [§63.1255(g)(5)(v)(A)]
- (2) Repair methods applied in each attempt to repair the leak. [§63.1255(g)(5)(v)(B)]
- (3) The reason for the delay of repair. [§63.1255(g)(5)(v)(C)]
- (4) The expected date for delivery of the replacement equipment and the actual date of delivery of the replacement equipment. [§63.1255(g)(5)(v)(D)]
- (5) The date of successful repair. [§63.1255(g)(5)(v)(E)]
- f) *Records of relief device compliance tests.* The dates and results of the monitoring following a pressure release for each pressure relief device subject to the provisions in §§63.165(a) and (b). The results shall include: [§63.1255(g)(6)]
- i) The background level measured during each compliance test. [§63.1255(g)(6)(i)]
- ii) The maximum instrument reading measured at each piece of equipment during each compliance test. [§63.1255(g)(6)(ii)]
- g) *Records for closed-vent systems.* The permittee shall maintain records of the information specified in §63.1255(g)(7)(i) through (iii) for closed-vent systems and control devices subject to the provisions of §63.1255(b)(4)(ii). The records specified in §63.1255(g)(7)(i) shall be retained for the life of the equipment. The records specified in §63.1255(g)(7)(ii) and (g)(7)(iii) shall be retained for 2 years. [§63.1255(g)(7)]
- i) The design specifications and performance demonstrations specified in §63.1255(g)(7)(i)(A) through (g)(7)(i)(D). [§63.1255(g)(7)(i)]
- (1) Detailed schematics, design specifications of the control device, and piping and instrumentation diagrams. [§63.1255(g)(7)(i)(A)]
- (2) The dates and descriptions of any changes in the design specifications. [§63.1255(g)(7)(i)(B)]
- (3) The flare design (i.e., steam assisted, air assisted, or nonassisted) and the results of the compliance demonstration required by §63.11(b). [§63.1255(g)(7)(i)(C)]
- (4) A description of the parameter or parameters monitored, as required in §63.1255(b)(4)(ii), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring. [§63.1255(g)(7)(i)(D)]
- ii) Records of operation of closed-vent systems and control devices. [§63.1255(g)(7)(ii)]
- (1) Dates and durations when the closed-vent systems and control devices required in §63.1255(c) and §§63.164 through 63.166 are not operated as designed as indicated by the monitored parameters, including periods when a flare pilot light system does not have a flame. [§63.1255(g)(7)(ii)(A)]

- (2) Dates and durations during which the monitoring system or monitoring device is inoperative. [§63.1255(g)(7)(ii)(B)]
- (3) Dates and durations of startups and shutdowns of control devices required in §63.1255(c)(7) and §§63.164 through 63.166. [§63.1255(g)(7)(ii)(C)]
- iii) Records of inspections of closed-vent systems subject to the provisions of §63.172. [§63.1255(g)(7)(iii)]
 - (1) For each inspection conducted in accordance with the provisions of §63.172(f)(1) or (f)(2) during which no leaks were detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [§63.1255(g)(7)(iii)(A)]
 - (2) For each inspection conducted in accordance with the provisions of §63.172(f)(1) or (f)(2) during which leaks were detected, the information specified in §63.1255(g)(4) shall be recorded. [§63.1255(g)(7)(iii)(B)]
- h) *Records for components in heavy liquid service.* Information, data, and analysis used to determine that a piece of equipment or process is in heavy liquid service shall be recorded. Such a determination shall include an analysis or demonstration that the process fluids do not meet the criteria of "in light liquid or gas service." Examples of information that could document this include, but are not limited to, records of chemicals purchased for the process, analyses of process stream composition, engineering calculations, or process knowledge. [§63.1255(g)(8)]
- i) *Records of exempt components.* Identification, either by list, location (area or group) of equipment in organic HAP service less than 300 hours per year subject to the provisions of §63.1255. [§63.1255(g)(9)]
- j) *Records of alternative means of compliance determination.* Owners and operators choosing to comply with the requirements of §63.179 shall maintain the following records: [§63.1255(g)(10)]
 - i) Identification of the process(es) and the organic HAP they handle. [§63.1255(g)(10)(i)]
 - ii) A schematic of the process, enclosure, and closed-vent system. [§63.1255(g)(10)(ii)]
 - iii) A description of the system used to create a negative pressure in the enclosure to ensure that all emissions are routed to the control device. [§63.1255(g)(10)(iii)]
- 3) *Record keeping for Valves in Gas/Vapor Service and in Light Liquid Service* In addition to records required by §63.1255(g), the permittee shall maintain records specified in §63.1255(e)(5)(iv)(A) through (D). [§63.1255(e)(5)(iv)]
 - a) Which valves are assigned to each subgroup, [§63.1255(e)(5)(iv)(A)]
 - b) Monitoring results and calculations made for each subgroup for each monitoring period, [§63.1255(e)(5)(iv)(B)]
 - c) Which valves are reassigned and when they were reassigned, and [§63.1255(e)(5)(iv)(C)]
 - d) The results of the semiannual overall performance calculation required in §63.1255(e)(5)(iii). [§63.1255(e)(5)(iv)(D)]

Reporting

- 1) *Reporting Requirements.* [§63.1255(h)]
 - a) The permittee shall submit the reports listed in §63.1255(h)(1)(i) through (ii). [§63.1255(h)(1)]
 - i) A Notification of Compliance Status Report described in §63.1255(h)(2), [§63.1255(h)(1)(i)]
 - ii) Periodic reports described in §63.1255(h)(3). [§63.1255(h)(1)(ii)]
 - b) *Notification of compliance status report.* The permittee shall submit the information specified in §63.1255(h)(2)(i) through (iii) in the Notification of Compliance Status Report described in §63.1260(f). [§63.1255(h)(2)]
 - i) The notification shall provide the information listed in §63.1255(h)(2)(i)(A) through (C) for each process subject to the requirements of §63.1255(b) through (g). [§63.1255(h)(2)(i)]
 - (1) Process group identification. [§63.1255(h)(2)(i)(A)]
 - (2) Number of each equipment type (e.g., valves, pumps) in organic HAP service, excluding equipment in vacuum service. [§63.1255(h)(2)(i)(B)]
 - (3) Method of compliance with the standard (for example, "monthly leak detection and repair" or "equipped with dual mechanical seals"). [§63.1255(h)(2)(i)(C)]
 - ii) The notification shall provide the information listed in §63.1255(h)(2)(ii)(A) and (B) for each process subject to the requirements of §63.1255(b)(4)(iv) and § 63.178(b). [§63.1255(h)(2)(ii)]
 - (1) Products or product codes subject to the provisions of §63.1255, and [§63.1255(h)(2)(ii)(A)]
 - (2) Planned schedule for pressure testing when equipment is configured for production of products subject to the provisions of §63.1255. [§63.1255(h)(2)(ii)(B)]

- iii) The notification shall provide the information listed in §63.1255(h)(2)(iii)(A) and (B) for each process subject to the requirements in §63.179. [§63.1255(h)(2)(iii)]
 - (1) Process identification. [§63.1255(h)(2)(iii)(A)]
 - (2) A description of the system used to create a negative pressure in the enclosure and the control device used to comply with the requirements of §63.1255(b)(4)(ii). [§63.1255(h)(2)(iii)(B)]
- iv) Section 63.9(j) shall not apply to the Notification of Compliance Status report described in this §63.1255(h)(2). [§63.1255(h)(2)(iv)]
- c) *Periodic reports.* The permittee shall submit Periodic Reports. [§63.1255(h)(3)]
 - i) A report containing the information in §63.1255(h)(3)(ii), (iii), and (iv) shall be submitted semiannually. The first report shall be submitted no later than 240 days after the Notification of Compliance Status Report is due and shall cover the 6-month period beginning on the date the Notification of Compliance Status Report is due. Each subsequent report shall cover the 6-month period following the preceding period. [§63.1255(h)(3)(i)]
 - ii) For equipment complying with the provisions of §63.1255(b) through (g), except §63.1255(b)(4)(iv) and §63.179, the summary information listed in §63.1255(h)(3)(ii)(A) through (L) for each monitoring period during the 6-month period. [§63.1255(h)(3)(ii)]
 - (1) The number of valves for which leaks were detected as described in §63.1255(e)(3), the percent leakers, and the total number of valves monitored; [§63.1255(h)(3)(ii)(A)]
 - (2) The number of valves for which leaks were not repaired as required in §63.1255(e)(7), identifying the number of those that are determined nonreparable; [§63.1255(h)(3)(ii)(B)]
 - (3) Separately, the number of pumps and agitators for which leaks were detected as described in §63.1255(c)(2), the total number of pumps and agitators monitored, and, for pumps, the percent leakers; [§63.1255(h)(3)(ii)(C)]
 - (4) Separately, the number of pumps and agitators for which leaks were not repaired as required in §63.1255(c)(3); [§63.1255(h)(3)(ii)(D)]
 - (5) The number of compressors for which leaks were detected as described in §63.164(f); [§63.1255(h)(3)(ii)(E)]
 - (6) The number of compressors for which leaks were not repaired as required in §63.164(g); [§63.1255(h)(3)(ii)(F)]
 - (7) The number of connectors for which leaks were detected as described in §63.174(a), the percent of connectors leaking, and the total number of connectors monitored; [§63.1255(h)(3)(ii)(G)]
 - (8) The number of connectors for which leaks were not repaired as required in §63.174(d), identifying the number of those that are determined nonreparable; [§63.1255(h)(3)(ii)(H)]
 - (9) The facts that explain any delay of repairs and, where appropriate, why a process shutdown was technically infeasible. [§63.1255(h)(3)(ii)(I)]
 - (10) The results of all monitoring to show compliance with §§63.164(i), 63.165(a), and 63.172(f) conducted within the semiannual reporting period. [§63.1255(h)(3)(ii)(J)]
 - (11) If applicable, the initiation of a monthly monitoring program under either §63.1255(c)(4)(ii) or §63.1255(e)(4)(i). [§63.1255(h)(3)(ii)(K)]
 - (12) If applicable, notification of a change in connector monitoring alternatives as described in §63.174(c)(1). [§63.1255(h)(3)(ii)(L)]
 - iii) For owners or operators electing to meet the requirements of §63.178(b), the report shall include the information listed in §63.1255(h)(3)(iii)(A) through (E) for each process. [§63.1255(h)(3)(iii)]
 - (1) Product process equipment train identification; [§63.1255(h)(3)(iii)(A)]
 - (2) The number of pressure tests conducted; [§63.1255(h)(3)(iii)(B)]
 - (3) The number of pressure tests where the equipment train failed either the retest or two consecutive pressure tests; [§63.1255(h)(3)(iii)(C)]
 - (4) The facts that explain any delay of repairs and; [§63.1255(h)(3)(iii)(D)]
 - (5) The results of all monitoring to determine compliance with §63.172(f) of Subpart H. [§63.1255(h)(3)(iii)(E)]
 - iv) Any revisions to items reported in earlier Notification of Compliance Status report, if the method of compliance has changed since the last report. [§63.1255(h)(3)(iv)]
- 2) *Reporting for Valves in Gas/Vapor Service and in Light Liquid Service*
 - a) In addition to the reporting requirements under §63.1255(h), the permittee shall notify the Administrator no later than 30 days prior to the beginning of the next monitoring period of the decision to subgroup valves. The

notification shall identify the participating processes and the valves assigned to each subgroup.
[§63.1255(e)(5)(v)]

- b) *Semiannual reports.* In addition to the information required by §63.1255(h)(3), the permittee shall submit in the periodic reports the information specified in §63.1255(e)(5)(vi)(A) and (B). [§63.1255(e)(5)(vi)]
- Valve reassignments occurring during the reporting period, and [§63.1255(e)(5)(vi)(A)]
 - Results of the semiannual overall performance calculation required by §63.1255(e)(5)(iii). [§63.1255(e)(5)(vi)(B)]

Permit Condition EU0950-008 through EU1131-008

10 CSR 10-6.075

Maximum Achievable Control Technology Regulations

40 CFR Part 63, Subpart GGG

National Emission Standards for Pharmaceutical Production – Liquid Streams in Open Systems

Emission Limitation:

Control requirements for certain liquid streams in open systems within a PMPU. (§63.1252(f))

- The permittee shall comply with the following control requirements, for each item of equipment meeting all the criteria specified in §63.1252(f)(2) through (4) and either §63.1252(f)(5)(i) or (ii). [§63.1252(f)(1)]
 - For a drain or drain hub: [Table 5 of Subpart GGG]
 - Tightly fitting solid cover (TFSC); or
 - TFSC with a vent to either a process or to a control device meeting the requirements of § 63.1256(h)(2) or;
 - Water seal with submerged discharge or barrier to protect discharge from wind.
 - For pipes: Each pipe shall have no visible gaps in joints, seals, or other emission interfaces. (Table 5 of Subpart GGG)
 - For tanks: Maintain a fixed roof and consider vents as process vents. A fixed roof may have openings necessary for proper venting of the tank, such as pressure/vacuum vent, j-pipe vent. [Table 5 of Subpart GGG]
 - For oil/water separators: [Table 5 of Subpart GGG]
 - Equip with a fixed roof and route vapors to a process or equip with a closed-vent system that routes vapors to a control device meeting the requirements of §63.1256(h)(2) or;
 - Equip with a floating roof that meets the equipment specifications of §60.693(a)(1)(i), (a)(1)(ii), (a)(2), (a)(3), and (a)(4).
 - For manholes, lift stations and trenches: (Note: Manhole includes sumps and other points of access to a conveyance system) [Table 5 of Subpart GGG]
 - TFSC or;
 - TSFC with a vent to either a process or to a control device meeting the requirements of § 63.1256(h)(2) or;
 - If the manholes or lift stations or trenches are vented to the atmosphere, use a TFSC with a properly operating water seal at the entrance or exit to each item of equipment to restrict ventilation in the collection system. The vent pipe shall be at least 90 cm in length and not exceeding 10.2 cm in nominal inside diameter. The lift station shall be level controlled to minimize changes in the liquid level.
- The item of equipment is of a type identified in Table 5 of Subpart GGG; [§63.1252(f)(2)]
- The item of equipment is part of a PMPU, as defined in §63.1251; [§63.1252(f)(3)]
- The item of equipment is controlled less stringently than in Table 5 of this subpart and the item of equipment is not otherwise exempt from controls by the provisions of Subpart GGG or subpart A of Part 63 and; [§63.1252(f)(4)]
- The item of equipment: [§63.1252(f)(5)]
 - Is a drain, drain hub, manhole, lift station, trench, pipe, or oil/water separator that conveys water with an annual average concentration greater than or equal to 1,300 parts per million by weight (ppmw) of partially soluble HAP compounds; or an annual average concentration greater than or equal to 5,200 ppmw of partially soluble and/or soluble HAP compounds. The annual average concentration shall be determined according to the procedures in §63.1257(e)(1)(ii). [§63.1252(f)(5)(i)]
 - Is a tank that receives one or more streams that contain water with an annual average concentration greater than or equal to 1,300 ppmw of partially soluble HAP compounds, or greater than or equal to 5,200 ppmw of total partially soluble and/or soluble HAP compounds. The permittee shall determine the average concentration of the stream at the inlet to the tank and according to the procedures in §63.1257(e)(1)(ii). [§63.1252(f)(5)(ii)]

Testing Methods and Compliance Procedures:

- 1) Where a tightly fitting solid cover is required, it shall be maintained with no visible gaps or openings, except during periods of sampling, inspection, or maintenance. [Table 5 of Subpart GGG, Footnote "a"]
- 2) *Determination of annual average concentration.* The permittee shall determine annual average concentrations of partially soluble and/or soluble HAP compounds in accordance with the provisions specified in §63.1257(e)(1)(ii)(A), (B), or (C). The permittee may determine annual average concentrations by process simulation. Data and other information supporting the simulation shall be reported in the Precompliance Report for approval by the Administrator. The annual average concentration shall be determined either at the POD or downstream of the POD with adjustment for concentration changes made according to §63.1257(e)(1)(ii)(D). [§63.1257(e)(1)(ii)]
 - a) *Test methods.* The concentration of partially soluble HAP, soluble HAP, or total HAP shall be measured using any of the methods described in §63.1257(b)(10)(i) through (iv). [§63.1257(e)(1)(ii)(A)]
 - b) *Knowledge of the wastewater stream.* The concentration of partially soluble HAP, soluble HAP, or total HAP shall be calculated based on knowledge of the wastewater stream according to the procedures in §63.1257(e)(1)(ii)(B)(1) and (2). The permittee shall document concentrations in the Notification of Compliance Status report described in §63.1260(f). [§63.1257(e)(1)(ii)(B)]
 - i) *Mass balance.* The permittee shall calculate the concentrations of HAP compounds in wastewater considering the total quantity of HAP discharged to the water, the amount of water at the POD, and the amounts of water and solvent lost to other mechanisms such as reactions, air emissions, or uptake in product or other processing materials. The quantities of HAP and water shall be based on batch sheets, manufacturing tickets, or FDA bills of materials. In cases where a chemical reaction occurs that generates or consumes HAP, the amount of HAP remaining after a reaction shall be based on stoichiometry assuming 100 percent theoretical consumption or yield, as applicable. [§63.1257(e)(1)(ii)(B)(1)]
 - ii) *Published water solubility data.* For single components in water, owners and operators may use the water solubilities published in standard reference texts at the POD temperature to determine maximum HAP concentration. [§63.1257(e)(1)(ii)(B)(2)]
 - c) *Adjustment for concentrations determined downstream of the POD.* The permittee shall make corrections to the annual average concentration when the concentration is determined downstream of the POD at a location where: two or more wastewater streams have been mixed; one or more wastewater streams have been treated; or, losses to the atmosphere have occurred. The permittee shall make the adjustments either to the individual data points or to the final annual average concentration. [§63.1257(e)(1)(ii)(D)]

Permit Condition EU0950 through EU1131-009

10 CSR 10-6.065

Operating Permits

10 CSR 10-6.075

Maximum Achievable Control Technology Regulations

40 CFR Part 63, Subpart GGG

National Emission Standards for Pharmaceutical Production

Notification of Compliance Status Report (Public Version)- Submitted to US EPA on March 20, 2003

Emission Limitation:

- 1) The permittee shall ensure that less than 41 batches of PMPU#10 (Product 10) will be manufactured in any consecutive twelve (12) month period.
- 2) The permittee shall ensure that less than 11 batches of PMPU#11 (Product 11) will be manufactured in any consecutive twelve (12) month period.
- 3) The permittee shall ensure that less than 154 batches of PMPU#12 (Product 12) will be manufactured in any consecutive twelve (12) month period.
- 4) The permittee shall ensure that less than 14 batches of PMPU#13 (Product 13) will be manufactured in any consecutive twelve (12) month period.
- 5) The permittee shall ensure that less than 9 batches of PMPU#14 (Product 14) will be manufactured in any consecutive twelve (12) month period.
- 6) The permittee shall ensure that less than 207 batches of PMPU#16 (Product 16) will be manufactured in any consecutive twelve (12) month period.

- 7) The permittee shall ensure that less than 23 batches of PMPU#17 (Product 17) will be manufactured in any consecutive twelve (12) month period.
- 8) The permittee shall ensure that less than 3 batches of PMPU#18 (Product 18) will be manufactured in any consecutive twelve (12) month period.

Monitoring:

- 1) The permittee shall ensure that at all times this batch operation takes place, the associated control devices such as condensers and caustic scrubbers are in operation.
- 2) The permittee shall perform the following to ensure proper functioning of the equipment:
 - a) If leaks or abnormal conditions are detected, the appropriate measures for remediation shall be implemented within eight (8) hours.
 - b) All instruments and control equipment shall be calibrated, maintained and operated according to manufacturer's specifications.

Record Keeping:

- 1) The permittee shall keep monthly records/logs of the number of batches reacted to determine compliance with the permit conditions on a rolling twelve (12) month basis.
- 2) The permittee shall keep adequate records of raw materials, chemical usage, quantities of final products and disposal of chemicals.
- 3) The cooling system temperatures shall be recorded on a continuous or hourly basis, when the process is operating and the vapors are being condensed.
- 4) The permittee shall keep maintenance records for the condenser and caustic scrubber.
- 5) All records shall be maintained for a period of five (5) years.
- 6) The permittee shall make all records available for inspection to the City of St. Louis or the Department of Natural Resources' personnel upon request.

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation or an exceedance of any of the terms imposed by this permit condition, or any malfunction which causes a deviation from or an exceedance of this permit condition.

EU1140

Broadway Installation – Natural Gas Fired Boiler

General Description:	12.55 MMBtu/hr Natural Gas Fired Boiler (1996)
Manufacturer/Model #:	Cleaver Brooks Boiler, Model No. CB-300
EIQ Reference # (2002):	EP-5801

Permit Condition EU1140-001

10 CSR 10-6.060

Construction Permits Required

Permit No. SR04.009 (Replaces Source Registration Permit No. 01720) – Permit Issued February 13, 2004

10 CSR 10-6.070

New Source Performance Regulations

40 CFR Part 60 Subpart Dc

Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

Emission Limitation:

The permittee shall only use pipeline grade natural gas as a source of fuel for this boiler.

[Permit No. SR04.009]

Monitoring/Record Keeping:

The permittee shall record and maintain records of the amount of fuel combusted during each month.

[EPA Region VII Letter of Approval of Reduced Record Keeping Frequency, Dated April 29, 1998]

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition.

[Permit No. SR04.009]

EU1150 Broadway Installation – Medical Liquid and Powder Nutrient Manufacture	
General Description:	Medical Liquid and Powder Nutrients Manufacturing Process consisting of three (3) ball mills, one (1) powder blending system, two (2) powder fill lines, three (3) liquid blenders, an aseptic fill line, a bag fill line, one (1) liquid fill line and several fugitive sources. Emissions are controlled by a dust collector for the milling and aseptic filling operations.
Manufacturer/Model #:	Unavailable
EIQ Reference # (2002):	EP-5101

Permit Condition EU1150-001

10 CSR 10-6.060

Construction Permits Required

Permit No. 96-02-018A – Permit Issued September 18, 1998

Emission Limitation:

- 1) The permittee shall not emit greater than 0.01 tons per year of PM₁₀ from EU1150.
- 2) The permittee shall emit less than 0.05 tons per year of HCl mist from EU1150.
- 3) The permittee shall not emit greater than 1.75 tons per year of VOCs from EU1150.
- 4) The permittee shall not mill, powder fill, aseptic fill and purify greater than 16,400,000 pounds of medical liquid and powder nutrients in any consecutive twelve (12) month period.
- 5) The permittee shall not use more than 600 gallons of isopropyl alcohol for aseptic filling in any consecutive twelve (12) month period.
- 6) The permittee shall obtain a written approval from the City of St. Louis, Air Pollution Control Program for the use of chloroform in the processes.

Monitoring:

- 1) At all times this process is in operation, the permittee shall operate the dust collector (HEPA filter) and other controls.
- 2) Control equipment shall be operated in accordance with the permittee's maintenance plan and good air pollution control practices for minimizing emissions.
- 3) The permittee shall check and document the fabric filter pressure drop daily. If the pressure drops fails the manufacturer's recommended operating range, corrective action shall be taken within eight (8) hours to return the pressure drop to the recommended range.
- 4) The permittee shall thoroughly inspect the fabric (bags) for leaks and wear and check the cleaning sequence of the filter semi annually.
- 5) Inspect every six (6) months all components that are not subject to wear or plugging, including structural components, housing, ducts and hoods.
- 6) If leaks or abnormal conditions are detected the appropriate measures for remediation shall be implemented within eight (8) hours. Bag replacement should be documented. Maintain a written record of the inspection and any action resulting from the inspection. All instruments and control equipment shall be calibrated, maintained, and operated according to the manufacture's specifications.

Record Keeping:

- 1) The permittee shall keep monthly records of process throughput, usage of isopropyl alcohol and 10N HCl.
- 2) The permittee shall keep daily records of the pressure drop across the HEPA filter.
- 3) The permittee shall maintain a written record of the inspection of the fabric filters and any action resulting from the inspection.

Reporting:

The permittee shall report to the St. Louis City Air Pollution Control Program, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any deviation from or an exceedance of any of the terms imposed by this permit condition, or any malfunction which causes any deviation from or an exceedance of this permit condition.

IV. Core Permit Requirements

The installation shall comply with each of the following emission limitations. Consult the appropriate sections in the Code of Federal Regulations (CFR) and Code of State Regulations (CSR) for the full text of the applicable requirements.

10 CSR 10-6.050, Start-up, Shutdown and Malfunction Conditions

- (a.) In the event of a malfunction, which results in excess emissions that exceed one hour, the permittee shall submit to the director within two business days in writing the following information:
 - (1.) Name and location of installation;
 - (2.) Name and telephone number of person responsible for the installation;
 - (3.) Name of the person who first discovered the malfunction and precise time and date that the malfunction was discovered.
 - (4.) Identity of the equipment causing the excess emissions;
 - (5.) Time and duration of the period of excess emissions;
 - (6.) Cause of the excess emissions;
 - (7.) Air pollutants involved;
 - (8.) Best estimate of the magnitude of the excess emissions expressed in the units of the applicable requirement and the operating data and calculations used in estimating the magnitude;
 - (9.) Measures taken to mitigate the extent and duration of the excess emissions; and
 - (10.) Measures taken to remedy the situation that caused the excess emissions and the measures taken or planned to prevent the recurrence of these situations.
- (b.) The permittee shall submit the paragraph (a.) information list to the director in writing at least ten days prior to any maintenance, start-up or shutdown, which is expected to cause an excessive release of emissions that exceed one hour. If notice of the event cannot be given ten days prior to the planned occurrence, it shall be given as soon as practicable prior to the release. If an unplanned excess release of emissions exceeding one hour occurs during maintenance, start-up or shutdown, the director shall be notified verbally as soon as practical during normal working hours and no later than the close of business of the following working day. A written notice shall follow within ten working days.
- (c.) Upon receipt of a notice of excess emissions issued by an agency holding a certificate of authority under section 643.140, RSMo, the permittee may provide information showing that the excess emissions were the consequence of a malfunction, start-up or shutdown. The information, at a minimum, should be the paragraph (a.) list and shall be submitted not later than 15 days after receipt of the notice of excess emissions. Based upon information submitted by the permittee or any other pertinent information available, the director or the commission shall make a determination whether the excess emissions constitute a malfunction, start-up or shutdown and whether the nature, extent and duration of the excess emissions warrant enforcement action under section 643.080 or 643.151, RSMo.
- (d.) Nothing in this rule shall be construed to limit the authority of the director or commission to take appropriate action, under sections 643.080, 643.090 and 643.151, RSMo to enforce the provisions of the Air Conservation Law and the corresponding rule.
- (e.) Compliance with this rule does not automatically absolve the permittee of liability for the excess emissions reported.

10 CSR 10-6.060, Construction Permits Required

The permittee shall not commence construction, modification, or major modification of any installation subject to this rule, begin operation after that construction, modification, or major modification, or begin operation of any installation which has been shut down longer than five years without first obtaining a permit from the permitting authority.

10 CSR 10-6.065, Operating Permits

The permittee shall file a complete application for renewal of this operating permit at least six months before the date of permit expiration. In no event shall this time be greater than eighteen months. [10 CSR 10-6.065(6)(B)1.A(V)] The permittee shall retain the most current operating permit issued to this installation on-site. [10 CSR 10-6.065(6)(C)1.C(II)] The permittee shall immediately make such permit available to any Missouri Department of Natural Resources personnel upon request. [10 CSR 10-6.065(6)(C)3.B]

10 CSR 10-6.110, Submission of Emission Data, Emission Fees and Process Information

- (a.) The permittee shall complete and submit an Emission Inventory Questionnaire (EIQ) in accordance with the requirements outlined in this rule.
- (b.) The permittee shall pay an annual emission fee per ton of regulated air pollutant emitted according to the schedule in the rule. This fee is an emission fee assessed under authority of RSMo. 643.079 to satisfy the requirements of the Federal Clean Air Act, Title V.
- (c.) The fees shall be due April 1 each year for emissions produced during the previous calendar year. The fees shall be payable to the Department of Natural Resources and shall be accompanied by the Emissions Inventory Questionnaire (EIQ) form or equivalent approved by the director.

10 CSR 10-6.130, Controlling Emissions During Episodes of High Air Pollution Potential

This rule specifies the conditions that establish an air pollution alert (yellow/orange/red/purple), or emergency (maroon) and the associated procedures and emissions reduction objectives for dealing with each. The permittee shall submit an appropriate emergency plan if required by the Director.

10 CSR 10-6.150, Circumvention

The permittee shall not cause or permit the installation or use of any device or any other means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission or air contaminant which violates a rule of the Missouri Air Conservation Commission.

10 CSR 10-6.170, Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin

- (a.) The permittee shall not cause or allow to occur any handling, transporting or storing of any material; construction, repair, cleaning or demolition of a building or its appurtenances; construction or use of a road, driveway or open area; or operation of a commercial or industrial installation without applying reasonable measures as may be required to prevent, or in a manner which allows or may allow, fugitive particulate matter emissions to go beyond the premises of origin in quantities that the particulate matter may be found on surfaces beyond the property line of origin. The nature or origin of the particulate matter shall be determined to a reasonable degree of certainty by a technique proven to be accurate and approved by the director.
- (b.) The permittee shall not cause nor allow to occur any fugitive particulate matter emissions to remain visible in the ambient air beyond the property line of origin.
- (c.) Should it be determined that noncompliance has occurred, the director may require reasonable control measures as may be necessary. These measures may include, but are not limited to, the following:
 - (1.) Revision of procedures involving construction, repair, cleaning and demolition of buildings and their appurtenances that produce particulate matter emissions;
 - (2.) Paving or frequent cleaning of roads, driveways and parking lots;
 - (3.) Application of dust-free surfaces;
 - (4.) Application of water; and
 - (5.) Planting and maintenance of vegetative ground cover.

10 CSR 10-6.180, Measurement of Emissions of Air Contaminants

- (a.) The director may require any person responsible for the source of emission of air contaminants to make or have made tests to determine the quantity or nature, or both, of emission of air contaminants from the source. The director may specify testing methods to be used in accordance with good professional practice. The director may observe the testing. All tests shall be performed by qualified personnel.
- (b.) The director may conduct tests of emissions of air contaminants from any source. Upon request of the director, the person responsible for the source to be tested shall provide necessary ports in stacks or ducts and other safe and proper sampling and testing facilities, exclusive of instruments and sensing devices as may be necessary for proper determination of the emission of air contaminants.
- (c.) The director shall be given a copy of the test results in writing and signed by the person responsible for the tests.

St. Louis City Ordinance 65645, Sec 15 , Open Burning Restrictions

- (a.) No person shall cause, suffer, allow or permit the open burning of refuse.
- (b.) No person shall conduct, cause or permit the conduct of a salvage operation by open burning.
- (c.) No person shall conduct, cause or permit the disposal of trade waste by open burning.
- (d.) No person shall cause or permit the open burning of leaves, trees or the byproducts therefrom, grass, or other vegetation.
- (e.) It shall be prima-facie evidence that the person who owns or controls property on which open burning occurs, has caused or permitted said open burning.

10 CSR 10-5.160, Restriction of Emission of Odors

No person shall emit odorous matter as to cause an objectionable odor on or adjacent to:

- (a.) Residential, recreational, institutional, retail sales, hotel or educational premises.
- (b.) Industrial premises when air containing odorous matter is diluted with 20 or more volumes of odor-free air; or
- (c.) Premises other than those in paragraphs (1)A.1. and (2) of the rule when air containing odorous matter is diluted with four or more volumes of odor-free air.

The previously mentioned requirement shall apply only to objectionable odors. An odor will be deemed objectionable when 30% or more of a sample of the people exposed to it believe it to be objectionable in usual places of occupancy; the sample size to be at least 20 people or 75% of those exposed if fewer than 20 people are exposed.

This requirement is not federally enforceable.

10 CSR 10-5.170, Control of Odors From Processing of Animal Matter

- (a.) No person shall operate or use any device, machine, equipment or other contrivance for the reduction of animal matter unless all gases, vapors and gas-entrained effluents from the facility are incinerated at a temperature of not less than twelve hundred degrees Fahrenheit (1200°F) for a period of not less than 0.3 second, or processed in a manner as determined by the director to be equally or more effective for the purpose of air pollution control.
- (b.) A person incinerating or processing gases, vapors or gas-entrained effluents pursuant to this rule shall provide, properly install and maintain, in good working order and in operation, devices as specified by the director for indicating temperature, pressure or other operating conditions.
- (c.) Effective devices and/or measures shall be installed and operated so that no vent, exhaust pipe, blow-off pipe or opening of any kind shall discharge into the outdoor air any odorous matter, vapors, gases or dusts or any combination which create odors or other nuisances in the neighborhood of the plant.
- (d.) Odor-producing materials shall be stored and handled in a manner so that odors produced from the materials are confined. Accumulation of odor-producing materials resulting from spillage or other escape is prohibited.

- (e.) Odor-bearing gases, vapors, fumes or dusts arising from materials in process shall be confined at the point of origin so as to prevent liberation of odorous matter. Confined gases, vapors, fumes or dusts shall be treated before discharge to the atmosphere.
- (f.) Enclosure of Building May Be Required. Whenever dust, fumes, gases, mist, odorous matter, vapors or any combination thereof escape from a building used for processing of animal matter in a manner and amount as to cause a violation of 10 CSR 10-5.160, the director may order that the building(s) in which processing, handling and storage are done be tightly closed and ventilated in a way that all air and gases and air or gas-borne material leaving the building are treated by incineration or other effective means for removal or destruction of odorous matter or other air contaminants before discharge into the open air.

10 CSR 10-5.120, Information on Sales of Fuels to be Provided and Maintained

Every delivery of coal or residual fuel oil when first delivered to a consumer or wholesaler in the St. Louis metropolitan area must be accompanied by a ticket prepared in triplicate and containing at least the name and address of the seller and the buyer; the grade of fuel; ash content of coal, the source of the fuel, which must be an approved source, and such other information as the Air Conservation Commission may require. One copy of each ticket shall be kept by the person delivering the fuel and be retained for one year; one copy is to be given to the recipient of the fuel to be retained for one year; and, upon request, within 30 days after delivery of the fuel, the delivering party shall mail one copy to the Air Conservation Commission.

10 CSR 10-5.240, Additional Air Quality Control Measures May be Required When Sources Are Clustered in a Small Land Area

The Air Conservation Commission may prescribe more restrictive air quality control requirements that are more restrictive and more extensive than provided in regulations of general application for:

- (a.) Areas in which there are one (1) or more existing sources and/or proposed new sources of particulate matter in any circular area with a diameter of two (2) miles (including sources outside metropolitan area) from which the sum of particulate emissions allowed from these sources by regulations of general application are or would be greater than two thousand (2000) tons per year or five hundred (500) pounds per hour.
- (b.) Areas in which there are one (1) or more existing sources and/or proposed new sources of sulfur dioxide in any circular area with a diameter of two (2) miles from which the sum of sulfur dioxide emissions from these sources allowed by regulations of general application are or would be greater than one thousand (1000) tons for any consecutive three (3) months or one thousand (1000) pounds per hour.

10 CSR 10-6.100, Alternate Emission Limits

Proposals for alternate emission limitations shall be submitted on Alternate Emission Limits Permit forms provided by the department. An installation owner or operator must obtain an Alternate Emission Limits Permit in accordance with 10 CSR 10-6.100 before alternate emission limits may become effective.

10 CSR 10-6.080, Emission Standards for Hazardous Air Pollutants

40 CFR Part 61 Subpart M, National Emission Standard for Asbestos

- (a) The permittee shall follow the procedures and requirements of 40 CFR Part 61, Subpart M for any activities occurring at this installation which would be subject to provisions for 40 CFR Part 61, Subpart M, National Emission Standard for Asbestos.
- (b) The permittee shall conduct monitoring to demonstrate compliance with registration, certification, notification, and Abatement Procedures and Practices standards as specified in 40 CFR Part 61, Subpart M.

10 CSR 10-6.250, Asbestos Abatement Projects – Certification, Accreditation, and Business Exemption Requirements

The permittee shall conduct all asbestos abatement projects within the procedures established for certification and accreditation by 10 CSR 10-6.250. This rule requires individuals who work in asbestos abatement projects to be certified by the Missouri Department of Natural Resources Air Pollution Control Program. This rule requires training providers who offer training for asbestos abatement occupations to be accredited by the Missouri Department of Natural Resources Air Pollution Control Program. This rule requires persons who hold exemption status from certain requirements of this rule to allow the department to monitor training provided to employees. Each individual who works in asbestos abatement projects must first obtain certification for the appropriate occupation from the department. Each person who offers training for asbestos abatement occupations must first obtain accreditation from the department. Certain business entities that meet the requirements for state-approved exemption status must allow the department to monitor training classes provided to employees who perform asbestos abatement.

Title VI – 40 CFR Part 82, Protection of Stratospheric Ozone

- (a.) The permittee shall comply with the standards for labeling of products using ozone-depleting substances pursuant to 40 CFR Part 82, Subpart E:
 - (1.) All containers in which a class I or class II substance is stored or transported, all products containing a class I substance, and all products directly manufactured with a class I substance must bear the required warning statement if it is being introduced into interstate commerce pursuant to §82.106.
 - (2.) The placement of the required warning statement must comply with the requirements pursuant to §82.108.
 - (3.) The form of the label bearing the required warning statement must comply with the requirements pursuant to §82.110.
 - (4.) No person may modify, remove, or interfere with the required warning statement except as described in §82.112.
- (b.) The permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR part 82, Subpart F, except as provided for motor vehicle air conditioners (MVACs) in Subpart B:
 - (1.) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to §82.156.
 - (2.) Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to §82.158.
 - (3.) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to §82.161.
 - (4.) Persons disposing of small appliances, MVACs, and MVAC-like appliances must comply with record keeping requirements pursuant to §82.166. ("MVAC-like" appliance as defined at §82.152).
 - (5.) Persons owning commercial or industrial process refrigeration equipment must comply with the leak repair requirements pursuant to §82.156.
 - (6.) Owners/operators of appliances normally containing 50 or more pounds of refrigerant must keep records of refrigerant purchased and added to such appliances pursuant to §82.166.
- (c.) If the permittee manufactures, transforms, imports, or exports a class I or class II substance, the permittee is subject to all the requirements as specified in 40 CFR part 82, Subpart A, Production and Consumption Controls.
- (d.) If the permittee performs a service on motor (fleet) vehicles when this service involves ozone-depleting substance refrigerant (or regulated substitute substance) in the motor vehicle air conditioner (MVAC), the permittee is subject to all the applicable requirements as specified in 40 CFR part 82, Subpart B, Servicing of Motor Vehicle Air conditioners. The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed. The term "MVAC" as used in

Subpart B does not include the air-tight sealed refrigeration system used as refrigerated cargo, or system used on passenger buses using HCFC-22 refrigerant.

The permittee shall be allowed to switch from any ozone-depleting substance to any alternative that is listed in the Significant New Alternatives Program (SNAP) promulgated pursuant to 40 CFR part 82, Subpart G, Significant New Alternatives Policy Program. *Federal Only - 40 CFR part 82*

10 CSR 10-6.280, Compliance Monitoring Usage

- (a.) The permittee is not prohibited from using the following in addition to any specified compliance methods for the purpose of submission of compliance certificates:
 - (1.) Monitoring methods outlined in 40 CFR Part 64;
 - (2.) Monitoring method(s) approved for the permittee pursuant to 10 CSR 10-6.065, "Operating Permits", and incorporated into an operating permit; and
 - (3.) Any other monitoring methods approved by the director.
- (b.) Any credible evidence may be used for the purpose of establishing whether a permittee has violated or is in violation of any such plan or other applicable requirement. Information from the use of the following methods is presumptively credible evidence of whether a violation has occurred by a permittee:
 - (1.) Monitoring methods outlined in 40 CFR Part 64;
 - (2.) A monitoring method approved for the permittee pursuant to 10 CSR 10-6.065, "Operating Permits", and incorporated into an operating permit; and
 - (3.) Compliance test methods specified in the rule cited as the authority for the emission limitations.
- (c.) The following testing, monitoring or information gathering methods are presumptively credible testing, monitoring, or information gathering methods:
 - (1.) Applicable monitoring or testing methods, cited in:
 - 10 CSR 10-6.030, "Sampling Methods for Air Pollution Sources";
 - 10 CSR 10-6.040, "Reference Methods";
 - 10 CSR 10-6.070, "New Source Performance Standards";
 - 10 CSR 10-6.080, "Emission Standards for Hazardous Air Pollutants"; or
 - (2.) Other testing, monitoring, or information gathering methods, if approved by the director, that produce information comparable to that produced by any method listed above.

V. General Permit Requirements

Permit Duration

10 CSR 10-6.065(6)(C)1.B.

This permit is issued for a term of five years, commencing on the date of issuance. This permit will expire at the end of this period unless renewed.

General Record Keeping and Reporting Requirements

10 CSR 10-6.065(6)(C)1.C

I) Record Keeping

- A) All required monitoring data and support information shall be retained for a period of at least five years from the date of the monitoring sample, measurement, report or application.
- B) Copies of all current operating and construction permits issued to this installation shall be kept on-site for as long as the permits are in effect. Copies of these permits shall be made immediately available to any City of St. Louis Air Pollution Control Program and Missouri Department of Natural Resources' personnel upon request.

II) Reporting

- A) The permittee shall submit a report of all required monitoring by:
 - 1) October 1st for monitoring which covers the January through June time period, and
 - 2) April 1st for monitoring which covers the July through December time period.
 - 3) Exception: Monitoring requirements which require reporting more frequently than semi annually shall report no later than 30 days after the end of the calendar quarter in which the measurements were taken.
- B) Each report must identify any deviations from emission limitations, monitoring, record keeping, reporting, or any other requirements of the permit, this includes deviations or Part 64 exceedances.
- C) All reports shall be submitted to the St. Louis City Air Pollution Control, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Program, Enforcement Section, P.O. Box 176, Jefferson City, MO 65102.
- D) Submit supplemental reports as required or as needed. Supplemental reports are required no later than ten days after any exceedance of any applicable rule, regulation or other restriction. All reports of deviations shall identify the cause or probable cause of the deviations and any corrective actions or preventative measures taken.
 - 1) Notice of any deviation resulting from an emergency (or upset) condition as defined in paragraph (6)(C)7 of 10 CSR 10-6.065 (Emergency Provisions) shall be submitted to the permitting authority either verbally or in writing within two working days after the date on which the emission limitation is exceeded due to the emergency, if you wish to assert an affirmative defense. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that indicate an emergency occurred and that you can identify the cause(s) of the emergency. The permitted installation must show that it was operated properly at the time and that during the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or requirements in the permit. The notice must contain a description of the emergency, the steps taken to mitigate emissions, and the corrective actions taken.
 - 2) Any deviation that poses an imminent and substantial danger to public health, safety or the environment shall be reported as soon as practicable.
 - 3) Any other deviations identified in the permit as requiring more frequent reporting than the permittee's semiannual report shall be reported on the schedule specified in the permit.

- 4) These supplemental reports shall be submitted to the St. Louis City Air Pollution Control, 1415 North 13th Street, St. Louis, MO 63106 and the Air Pollution Control Program, Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any exceedance of any applicable rule, regulation, or other restriction.
- E) Every report submitted shall be certified by the responsible official, except that, if a report of a deviation must be submitted within ten days after the deviation, the report may be submitted without a certification if the report is resubmitted with an appropriate certification within ten days after that, together with any corrected or supplemental information required concerning the deviation.
- F) The permittee may request confidential treatment of information submitted in any report of deviation.

Risk Management Plans Under Section 112(r)

10 CSR 10-6.065(6)(C)1.D.

The permittee shall comply with the requirements of 40 CFR Part 68, Accidental Release Prevention Requirements. If the permittee has more than a threshold quantity of a regulated substance in process, as determined by 40 CFR Section 68.115, the permittee shall submit a Risk Management Plan in accordance with 40 CFR Part 68 no later than the latest of the following dates:

- 1) June 21, 1999;
- 2) Three years after the date on which a regulated substance is first listed under 40 CFR Section 68.130; or
- 3) The date on which a regulated substance is first present above a threshold quantity in a process.

Severability Clause

10 CSR 10-6.065(6)(C)1.F.

In the event of a successful challenge to any part of this permit, all uncontested permit conditions shall continue to be in force. All terms and conditions of this permit remain in effect pending any administrative or judicial challenge to any portion of the permit. If any provision of this permit is invalidated, the permittee shall comply with all other provisions of the permit.

General Requirements

10 CSR 10-6.065(6)(C)1.G

- 1) The permittee must comply with all of the terms and conditions of this permit. Any noncompliance with a permit condition constitutes a violation and is grounds for enforcement action, permit termination, permit revocation and re-issuance, permit modification or denial of a permit renewal application.
- 2) The permittee may not use as a defense in an enforcement action that it would have been necessary for the permittee to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.
- 3) The permit may be modified, revoked, reopened, reissued or terminated for cause. Except as provided for minor permit modifications, the filing of an application or request for a permit modification, revocation and re-issuance, or termination, or the filing of a notification of planned changes or anticipated noncompliance, will not stay any permit condition.
- 4) This permit does not convey any property rights of any sort, nor grant any exclusive privilege.
- 5) The permittee shall furnish to the Air Pollution Control Program, upon receipt of a written request and within a reasonable time, any information that the Air Pollution Control Program reasonably may require to determine whether cause exists for modifying, reopening, reissuing or revoking the permit or to determine compliance with the permit. Upon request, the permittee also shall furnish to the Air Pollution Control Program copies of records required to be kept by the permittee. The permittee may make a claim of confidentiality for any information or records submitted pursuant to 10 CSR 10-6.065(6)(C)1.

Incentive Programs Not Requiring Permit Revisions

10 CSR 10-6.065(6)(C)1.H.

No permit revision will be required for any installation changes made under any approved economic incentive, marketable permit, emissions trading, or other similar programs or processes provided for in this permit.

Compliance Requirements

10 CSR 10-6.065(6)(C)3.

- I) Any document (including reports) required to be submitted under this permit shall contain a certification signed by the responsible official.
- II) Upon presentation of credentials and other documents as may be required by law, the permittee shall allow authorized officials of the Missouri Department of Natural Resources, or their authorized agents, to perform the following (subject to the installation's right to seek confidential treatment of information submitted to, or obtained by, the Air Pollution Control Program):
 - A) Enter upon the premises where a permitted installation is located or an emissions-related activity is conducted, or where records must be kept under the conditions of this permit;
 - B) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - C) Inspect, at reasonable times and using reasonable safety practices, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
 - D) As authorized by the Missouri Air Conservation Law, Chapter 643, RSMo or the Act, sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the terms of this permit, and all applicable requirements as outlined in this permit.
- III) All progress reports required under an applicable schedule of compliance shall be submitted semiannually (or more frequently if specified in the applicable requirement). These progress reports shall contain the following:
 - A) Dates for achieving the activities, milestones or compliance required in the schedule of compliance, and dates when these activities, milestones or compliance were achieved, and
 - B) An explanation of why any dates in the schedule of compliance were not or will not be met, and any preventative or corrective measures adopted.
- IV) The permittee shall submit an annual certification that it is in compliance with all of the federally enforceable terms and conditions contained in this permit, including emissions limitations, standards, or work practices. These certifications shall be submitted annually on April 1st, unless the applicable requirement specifies more frequent submission. These certifications shall be submitted to EPA Region VII, 901 North 5th Street, Kansas City, Kansas 66101, as well as the Air Pollution Control Program, Enforcement Section, P.O. Box 176, Jefferson City, MO 65102 and the City of St. Louis Air Pollution Control, 1415 North 13th Street, St. Louis, MO 63106. All deviations and Part 64 exceedances and excursions must be included in the compliance certifications. The compliance certification shall include the following:
 - A) The identification of each term or condition of the permit that is the basis of the certification,
 - B) The current compliance status, as shown by monitoring data and other information reasonably available to the installation,
 - C) Whether compliance was continuous or intermittent,
 - D) The method(s) used for determining the compliance status of the installation, both currently and over the reporting period, and
 - E) Such other facts as the Air Pollution Control Program will require in order to determine the compliance status of this installation.

Permit Shield

10 CSR 10-6.065(6)(C)6.

- I) Compliance with the conditions of this permit shall be deemed compliance with all applicable requirements as of the date that this permit is issued, provided that:
 - A) The applicable requirements are included and specifically identified in this permit; or
 - B) The permitting authority, in acting on the permit revision or permit application, determines in writing that other requirements, as specifically identified in the permit, are not applicable to the installation, and this permit expressly includes that determination or a concise summary of it.
- II) Be aware that there are exceptions to this permit protection. The permit shield does not affect the following:
 - A) The provisions of section 303 of the Act or section 643.090, RSMo concerning emergency orders,
 - B) Liability for any violation of an applicable requirement which occurred prior to, or was existing at, the time of permit issuance,
 - C) The applicable requirements of the acid rain program,
 - D) The administrator's authority to obtain information, or
 - E) Any other permit or extra-permit provisions, terms or conditions expressly excluded from the permit shield provisions.

Emergency Provisions

10 CSR 10-6.065(6)(C)7.

- I) An emergency or upset as defined in 10 CSR 10-6.065(6)(C)7. shall constitute an affirmative defense to an enforcement action brought for noncompliance with technology-based emissions limitations. To establish an emergency- or upset-based defense, you must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence, the following:
 - A) That an emergency or upset occurred and that you can identify the source of the emergency or upset,
 - B) That the installation was being operated properly,
 - C) That you took all reasonable steps to minimize emissions that exceeded technology-based emissions limitations or requirements in this permit, and
 - D) That you submitted notice of the emergency to the Air Pollution Control Program within two working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and any corrective actions taken.
- II) Be aware that an emergency or upset shall not include noncompliance caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

Operational Flexibility

10 CSR 10-6.065(6)(C)8.

An installation that has been issued a Part 70 operating permit is not required to apply for or obtain a permit revision in order to make any of the changes to the permitted installation described below if the changes are not Title I modifications, the changes do not cause emissions to exceed emissions allowable under the permit, and the changes do not result in the emission of any air contaminant not previously emitted. The permittee shall notify the Air Pollution Control Program and the Administrator at least seven days in advance of these changes, except as allowed for emergency or upset conditions. Emissions allowable under the permit means a federally enforceable permit term or condition determined at issuance to be required by an applicable requirement that established an emissions limit (including a work practice standard) or a federally enforceable emissions cap that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject.

- I) Section 502(b)(10) changes. Changes that, under section 502(b)(10) of the Act, contravene an express permit term may be made without a permit revision, except for changes that would violate applicable

requirements of the Act or contravene federally enforceable monitoring (including test methods), record keeping, reporting or compliance requirements of the permit.

- A) Before making a change under this provision, The permittee shall provide advance written notice to the Air Pollution Control Program and to the Administrator, describing the changes to be made, the date on which the change will occur, and any changes in emission and any permit terms and conditions that are affected. The permittee shall maintain a copy of the notice with the permit, and this agency shall place a copy with the permit in the public file. Written notice shall be provided to the administrator and this agency at least seven days before the change is to be made. If less than seven days notice is provided because of a need to respond more quickly to these unanticipated conditions, The permittee shall provide notice to the administrator and the permitting authority as soon as possible after learning of the need to make the change.
- B) The permit shield shall not apply to these changes.

Off-Permit Changes

10 CSR 10-6.065(6)(C)9.

- D) Except as noted below, The permittee may make any change in its permitted operations, activities or emissions that is not addressed in, constrained by or prohibited by this permit without obtaining a permit revision. Insignificant activities listed in the application, but not otherwise addressed in or prohibited by this permit, shall not be considered to be constrained by this permit for purposes of the off-permit provisions of this section. Off-permit changes shall be subject to the following requirements and restrictions:
 - A) The change must meet all applicable requirements of the Act and may not violate any existing permit term or condition; The permittee may not change a permitted installation without a permit revision, if this change is subject to any requirements under Title IV of the Act or is a Title I modification;
 - B) The permittee must provide written notice of the change to the permitting authority and to the administrator no later than the next annual emissions report. This notice shall not be required for changes that are insignificant activities under paragraph (6)(B)3. of this rule. This written notice shall describe each change, including the date, any change in emissions, pollutants emitted and any applicable requirement that would apply as a result of the change.
 - C) The permittee shall keep a record describing all changes made at the installation that result in emissions of a regulated air pollutant subject to an applicable requirement and the emissions resulting from these changes; and
 - D) The permit shield shall not apply to these changes.

Responsible Official

10 CSR 10-6.020(2)(R)12.

The application utilized in the preparation of this was signed by Larry Hummel, President. If this person terminates employment, or is reassigned different duties such that a different person becomes the responsible person to represent and bind the installation in environmental permitting affairs, the owner or operator of this air contaminant source shall notify the Director of the Air Pollution Control Program of the change. Said notification shall be in writing and shall be submitted within 30 days of the change. The notification shall include the name and title of the new person assigned by the source owner or operator to represent and bind the installation in environmental permitting affairs. All representations, agreement to terms and conditions and covenants made by the former responsible person that were used in the establishment of limiting permit conditions on this permit will continue to be binding on the installation until such time that a revision to this permit is obtained that would change said representations, agreements and covenants.

Reopening Permit For Cause

10 CSR 10-6.065(6)(E)6.

In accordance with 10 CSR 10-6.065(6)(E)6.A., this permit may be reopened with cause if:

- 1) The Missouri Department of Natural Resources (MDNR) receives notice from the Environmental Protection Agency (EPA) that a petition for disapproval of a permit pursuant to 40 CFR § 70.8(d) has been granted, provided that the reopening may be stayed pending judicial review of that determination,
- 2) The Missouri Department of Natural Resources or EPA determines that the permit contains a material mistake or that inaccurate statements were made which resulted in establishing the emissions limitation standards or other terms of the permit,
- 3) Additional applicable requirements under the Act become applicable to the installation; however, reopening on this ground is not required if the permit has a remaining term of less than three years, the effective date of the requirement is later than the date on which the permit is due to expire, or the additional applicable requirements are implemented in a general permit that is applicable to the installation and the installation receives authorization for coverage under that general permit,
- 4) The installation is an affected source under the acid rain program and additional requirements (including excess emissions requirements), become applicable to that source, provided that, upon approval by EPA, excess emissions offset plans shall be deemed to be incorporated into the permit; or
- 5) The Missouri Department of Natural Resources or EPA determines that the permit must be reopened and revised to assure compliance with applicable requirements.

Statement of Basis

10 CSR 10-6.065(6)(E)1.C.

This permit is accompanied by a statement setting forth the legal and factual basis for the draft permit conditions (including references to applicable statutory or regulatory provisions). This Statement of Basis, while referenced by the permit, is not an actual part of the permit.

Attachment A

10 CSR 10-5.030 Compliance Demonstration

10 CSR 10-5.030, *Maximum Allowable Emission of Particulate Matter from Fuel Burning Equipment Used for Indirect Heating*

Note: Existing Units: Installed before February 15, 1979. New Units are all units that are not existing.

Total Heat Input for Fuel Burning Equipment, Q

$$Q_{\text{total, all}} = Q_{\text{EU0010}} + Q_{\text{EU0020}} + Q_{\text{EU0650}} + Q_{\text{EU0660}} + Q_{\text{EU0670}} + Q_{\text{EU1140}} + Q_{\text{Small boiler}} + Q_{\text{Space Heaters and Dryers}}$$

$$Q_{\text{EU0010}} = 10.4 \text{ MMBtu/hour (permit application, Existing Unit)}$$

$$Q_{\text{EU0020}} = 10.4 \text{ MMBtu/hour (permit application, New Unit)}$$

$$Q_{\text{EU0650}} = 12.55 \text{ MMBtu/hour (permit application, New Unit)}$$

$$Q_{\text{EU0660}} = 12.55 \text{ MMBtu/hour (permit application, New Unit)}$$

$$Q_{\text{EU0670}} = 12.55 \text{ MMBtu/hour (permit application, New Unit)}$$

$$Q_{\text{EU1140}} = 12.55 \text{ MMBtu/hour (permit application, New Unit)}$$

$$Q_{\text{Small Boiler}} = 4.2 \text{ MMBtu/hour (Existing Unit)}$$

$$Q_{\text{Space Heaters and Dryers}} = 4.97 \text{ MMBtu/hour (all conservatively assumed to be existing)}$$

$$Q_{\text{total, all}} = 80.17 \text{ MMBtu/hour}$$

$$Q_{\text{total, only existing}} = 19.57 \text{ MMBTU/hour}$$

Allowable Emissions for Existing Installations, (E_{existing}) with heat inputs less than 10 MMBtu/hour: 0.60 lb/MMBtu

Allowable Emissions for Existing Installations, (E_{existing}) with heat inputs equal to or greater than 10 MMBTU/hour:

$$E_{\text{Existing}} = 1.09(Q_{\text{total, only existing}})^{-0.259}$$

$$E_{\text{Existing}} = 1.09(19.57)^{-0.259}$$

$$E_{\text{Existing}} = 0.50 \text{ lb/MMBtu}$$

Allowable Emissions for New Installations, (E_{new}) with heat inputs equal to or greater than 10 MMBtu/hour:

$$E_{\text{new}} = 0.80(Q_{\text{total, all}})^{-0.301}$$

$$E_{\text{new}} = 0.80(80.17)^{-0.301}$$

$$E_{\text{new}} = 0.21 \text{ lb/MMBtu}$$

EU0010 and EU0020: Natural Gas Fired Boilers Rated at 10.4 MMBtu/hour Each

Allowable Emissions for EU0010 (existing unit) = (0.50 lb PM/MMBtu/hour)(10.4 MMBtu/hour) = 5.20 lb/hour

Allowable Emissions for EU0020 (new unit) = (0.21 lb PM/MMBtu/hour)(10.4 MMBtu/hour) = 2.18 lb/hour

Potential Emissions (Natural Gas)

Emission Factor = (7.6 lb/MMSCF)(MMSCF/1,020 MMBtu) = 0.00745 lb/MMBtu (AP-42 Table 1.4-2)

PTE = (10.4 MMBtu/hour)(0.00745 lb PM/MMBtu)

PTE_{EU0010} = 0.08 lb PM/hr < 5.20 lb PM/hour

PTE_{EU0020} = 0.08 lb PM/hr < 2.18 lb PM/hour

EU0660 through EU0670 and EU1140: Natural Gas Fired Boilers Rated at 12.55 MMBtu/hour Each

Allowable Emissions for New Unit = (0.21 lb PM/MMBtu/hour)(12.55 MMBtu/hour) = 2.63 lb/hour

Potential Emissions (Natural Gas)

Emission Factor = (7.6 lb/MMSCF)(MMSCF/1,020 MMBtu) = 0.00745 lb/MMBtu (AP-42 Table 1.4-2)

PTE = (12.55 MMBtu/hour)(0.00745 lb PM/MMBtu)

PTE = 0.09 lb PM/hr < 2.63 lb PM/hour

Attachment B

10 CSR 10-6.060 Compliance Demonstration
Paint Booths Annual VOC Limit

This record-keeping sheet may be used for the record-keeping requirements for the Permit Conditions EU0030-001 and EU0680-001.

Date (Column 1)	Emission Unit (Column 2)	Paint Booth Operational Hours (Column 3)	Paint/Solvent/Thinner Type (Column 4)	Paint/Solvent/Thinner Throughput (units) (Column 5)	VOC Emission Factor Lbs/Unit (Column 6)	VOC Emissions (Pounds) (Column 7)	VOC Emissions (tons) (Column 8)
	EU0030						
	EU0680						

Sample Calculation: Column 7 = Column 5 x Column 6; Column 8 = Column 7/2000

10 CSR 10-5.550, *Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations Processes in the Synthetic Organic Chemical Manufacturing Industry*

This rule does not apply to Sigma-Aldrich Company because it does not operate any reactor or distillation units in a non-batch mode that has a design capacity of 1,100 tons or more per year.

10 CSR 10-6.240, *Asbestos Abatement Projects-Certification, Notification and Performance Requirements*

This rule has not been included in the operating permit because the rule was struck down in the Cole County Circuit Court.

10 CSR 10-6.350, *Emission Limitations and Emissions Trading of Oxides of Nitrogen*

This rule applies to any fossil fuel fired electric generating unit that serves a generator with a nameplate capacity of greater than twenty-five megawatts. There are no emission units at the installation that meet the applicability criteria of this rule.

10 CSR 10-6.260, *Restriction of Emission of Sulfur Compounds*

This rule is amended to update emission limits and references to regulations, changes the rule organization, and brings the rule up to date. The amended rule clarifies applicability of sources subject to New Source Performance Standards and this rule. The amended rule also includes an exemption for combustion equipment that uses exclusively pipeline grade natural gas as defined in 40 CFR 72.2 or liquefied petroleum gas as defined by American Society for Testing and Materials (ASTM), or any combination of these fuels.

All combustion equipment at the installation uses pipeline grade natural and is exempt from the requirements of this rule

10 CSR 10-6.400, *Restriction of Emission of Particulate Matter From Industrial Processes*

This rule does not apply if the emission units at maximum design capacities have a potential to emit less than one-half (0.5) pounds per hour of particulate matter. The emission units to which this rule potentially applies are those process units and their associated emission points that produce powder products. Based on information obtained from the Title V application, correspondence with Sigma-Aldrich Company and Permit 96-02-018A, it appears that the powder products are manufactured only in the Broadway installation. The potential to emit particulate matter from each of the process units (52 Mill, 210 Mills, 350 Blender, 3500 Blender and Fitzpatrick Mill) associated with the manufacture of powder products is significantly less than 0.5 pounds per hour. Therefore, the emission units at Sigma-Aldrich Company meet this exemption criterion and this rule was not included in the operating permit. Further information regarding manufacture of powdered nutrients is listed in Permit 96-02-018A.

Construction Permit Revisions

- 1) Dekalb Installation - Source Registration Permits for Storage Tanks Approved on March 7, 1988
- 2) Dekalb Installation - Source Registration Permit for Cold Cleaner Dated October 14, 1992
- 3) Cherokee Installation - Source Registration Permit No. H343 for Boiler Approved on March 3, 1986
- 4) Cherokee Installation - Source Registration Permit No. H344 for Boiler Approved on March 3, 1986
- 5) Cherokee Installation - Source Registration Permits for Storage Tanks. Approved on August 8, 1986
- 6) Cherokee Installation - Source Registration Permit for Waste Solvent Storage Tanks Approved on October 17, 1986
- 7) Cherokee Installation - Source Registration Permits for SVS Tanks Approved on June 15, 1998

A review of the permit files shows that the above permits (item nos. 1 through 7) have no special permit conditions. As such, applicable permit conditions were not listed for these construction permits in the operating permit.

- 8) Correction to Source Registration Permit No. 97-07-074 Issued on October 22, 1999.

- 9) Cherokee Installation – Permit No. 04-02-003 Issued on February 13, 2004 amends the information in Permit No. 98-03-020. Sigma Chemical Company constructed a boiler under Permit No. 98-03-020 issued on May 19, 1998. The application for the permit indicated the Maximum Heat Input of the boiler was 10.17 MMBtu/hr. This was actually the heat output; the actual heat input of the boiler of the unit is 12.55 MMBtu/hr.
- 10) Broadway Installation – Source Registration No. SR04.009 Issued on February 13, 2004
This source registration is intended to amend information contained in Source Registration No. 01720. In the previous permit the heat input of the unit was listed as being 10.2 MMBtu/hr. It was found that the unit is 12.55 MMBtu/hr boiler.

Operating Permit Revisions

- 1) Part 70 Operating Permit Application for Dekalb Installation, received August 17, 1998.
- 2) Part 70 Operating Permit Application for Cherokee Installation, received February 28, 2000, with Part 70 Application Addendum dated September 4, 2001.
- 3) Basic Operating Permit Application for Broadway Installation, received August 17, 1998
- 4) Combined Facilities (Dekalb, Cherokee and Broadway) Part 70 Operating Permit Application, received December 28, 2001.

Sigma-Aldrich Company originally submitted separate Part 70 applications for the Dekalb installation (PAMS: 1997-05-019) and the Cherokee installation (1997-05-020). Sigma-Aldrich Company also submitted a Basic Operating permit application for the Broadway installation (PAMS: OP98613, 510-0866-0001). After Sigma-Aldrich Company purchased land that made the properties between the three installations contiguous, the Department of Natural Resources made the determination the three installations are contiguous and will be treated as one installation., Sigma-Aldrich Company submitted a combined Part 70 Permit Application in December 2001 (PAMS: 2002-01-1062) for the three installations.

St. Louis City Ordinances

Ordinance 50163, Ordinance 55293, Ordinance 60023 and Ordinance 60629 have all been rescinded. The current applicable Ordinance is St. Louis City Ordinance No. 65645.

NSPS Applicability

- 1) 10 CSR 10-6.070, *New Source Performance Regulations*
40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*
EU0010, EU0020, EU0650 and EU0660 are not subject to Subpart Dc because the boilers were constructed prior to the applicability date of this rule. However, this rule applies to the boilers EU0670 and EU1140.
- 2) 10 CSR 10-6.070, *New Source Performance Regulations*
40 CFR Part 60, Subpart K, *Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978*
The provisions of this subpart are applicable to liquid storage vessels with capacities of at least 40,000 gallons for which construction, reconstruction, or modification commenced after June 11, 1973 and prior to May 19, 1978. This regulation defines petroleum liquids in 40 CFR Part 60, Subpart K, 60.111(b) as “petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery but does not mean Nos. 2 through 6 fuel oils as specified in ASTM D396-78.” There are no “petroleum liquid” storage tanks with the capacity greater than 40,000 gallons (Fuel oils nos. 2 through 6 and diesel fuel nos. 2-D and 4-D are exempt from the definition of “Petroleum Liquids”) that were installed after June 11, 1973 and Prior to July 23, 1984 at the installation. This rule does not apply.

3) 40 CFR Part 60 Subpart Kb, *Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) after July 23, 1984*

According to the Federal Register, on February 24, 2003, EPA proposed to amend various provisions in 40 CFR part 60, subpart Kb. The proposal also contained amendments to increase the vessel capacity applicability cutoff from 40 m³ (10,600 gallons) to 75 m³ (19,800 gallons). The proposed amendment for the vessel capacity cutoff from the February 24, 2003, Federal Register has been promulgated. Therefore, Dekalb Installation Raw Material Storage Tanks and Cherokee Installation Material Storage Tanks are not subject to this subpart because they have a capacity of 12,000 gallons each.

MACT Applicability

1) 10 CSR 10-6.075, *Maximum Achievable Control Technology Regulations*

40 CFR Part 63 Subpart GGG, *National Emissions Standards for Pharmaceuticals Production*

This rule applies only to the emission units located at Cherokee installation's T-East Building. This rule does not apply to other parts of the installation since the manufacturing processes at other parts of the installation do not manufacture products that meet the definition of pharmaceutical product under MACT Subpart GGG. Based on the Precompliance Report (dated April 19, 2002 and approved by the St. Louis City Air Pollution Control Program on July 16, 2002), the Notification of Compliance Status Report (dated March 20, 2003 and not yet approved by the City of St. Louis or the USEPA) and responses to questions from the Department of Natural Resources, the following information was gathered:

- Sigma-Aldrich Company does not desire to use alternative monitoring parameters
- Sigma-Aldrich Company desires to use the pollution prevention (P2) option under the MACT Standard.
- For process vents, Sigma-Aldrich Company will demonstrate compliance with the process-based annual mass limit.
- Sigma-Aldrich Company will not use the emissions averaging option.
- Sigma-Aldrich Company will not discharge affected wastewater under the MACT Standard by voluntarily limiting the number of batches of various products.
- All applicable PMPUs are batch process operations.
- The boilers in the Cherokee installation will not burn HAPs from the PMPUs.
- The condensers that are currently in place (with the -50 F glycol system) are process condensers, and do not function as control devices. There are no applicable small or large control devices that control emissions from the PMPUs.

Therefore, the applicable standards under the MACT are the emission standards for process vents, emission standards for leaks and emission standards for the pollution prevention option. Additionally the installation will have to meet the requirements of the start-up/shutdown/malfunction plans and liquid streams in open systems. The wastewater provisions of the MACT do not apply since Sigma-Aldrich Company is proposing to voluntarily limit the HAP loading in wastewater streams so that the wastewater stream will not be an applicable wastewater stream under the MACT standard.

There are certain requirements under the MACT for control devices such as condensers and scrubbers. However, the precompliance report indicates that there are no control devices controlling vent streams from processes subject to MACT, therefore, requirements for condensers and scrubbers have not been included in this permit.

Consistency with other regulations-Standards for Equipment Leaks: After the compliance date for a process, equipment subject to both §63.1255 and either of the following, will be required to comply only with the provisions of Subpart GGG: (§63.1255(a)(2))

- (i) 40 CFR part 60. (§63.1255(a)(2)(i))
- (ii) 40 CFR part 61. (§63.1255(a)(2)(ii))

The provisions in §63.1(a)(3) of 40 CFR Part 63, Subpart A do not alter the provisions in §63.1255(a)(2).
(§63.1255(a)(4))

Lines and equipment not containing process fluids are not subject to these provisions. Utilities, and other non-process lines, such as heating and cooling systems which do not combine their materials with those in the processes they serve, are not considered to be part of a process. (§63.1255(a)(5))

The provisions of §63.1255 do not apply to bench-scale processes, regardless of whether the processes are located at the same plant site as a process subject to the provisions of Subpart GGG. (§63.1255(a)(6))

Equipment that is in vacuum service is excluded from the general equipment leak requirements. (§63.1255(a)(8))

Equipment that is in organic HAP service, but is in such service less than 300 hours per calendar year, is excluded from the requirements of §63.1255 if it is identified as required in §63.1255(g)(9). (§63.1255(a)(9))

2) 10 CSR 10-6.075, *Maximum Achievable Control Technology Regulations*

40 CFR Part 63, Subpart T, *National Emission Standards for Halogenated Solvent Cleaning*

The provisions of this subpart apply to each individual batch vapor, in-line vapor, in-line cold, and batch cold solvent cleaning machine that uses any solvent containing methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride or chloroform, or any combination of these halogenated HAP solvents, in a total concentration greater than 5 percent by weight, as a cleaning and/or drying agent. Wipe cleaning activities, such as using a rag containing halogenated solvent are not covered under the provisions of this subpart.

The permittee operates cold cleaners using aqueous solutions. These units do not use halogenated solvents as defined in 40 CFR 63.460, therefore the cold cleaners are not subject to the MACT standards for halogenated solvent cleaning.

3) 10 CSR 10-6.075, *Maximum Achievable Control Technology Regulations*

40 CFR Part 63, Subpart PPP, *National Emission Standards for Polyether Polyols Production*

Sigma-Aldrich Co does not manufacture polyether polyols, therefore this MACT standard does not apply to the installation.

4) 10 CSR 10-6.075, *Maximum Achievable Control Technology Regulations*

40 CFR Part 63, Subpart MMM, *National Emission Standards for Pesticide Active Ingredient Production*

Sigma-Aldrich Co does not manufacture pesticide active ingredients, therefore this MACT standard does not apply to the installation.

5) 40 CFR Part 63, Subpart B, *Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections, Sections 112(g) and 112(j)*

On May 10, 2002, Sigma -Aldrich Co. submitted a 112(j) Part 1 Maximum Achievable Control Technology (MACT) application indicating that they may be subject to the MACT standards Subpart FFFF, National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing and Miscellaneous Coating Manufacturing and Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial/Commercial/Institutional Boilers and Process Heaters.

40 CFR Part 63 Subpart FFFF was finalized on August 25, 2003. Sigma-Aldrich Company shall submit an amendment to the Title V permit before the compliance date of this subpart. The compliance date for existing sources is three years from the date on which Subpart FFFF was finalized.

40 CFR Part 63 Subpart DDDDD was finalized on September 13, 2004. Sigma-Aldrich Company shall submit an amendment to the Title V permit before the compliance date of this subpart. The compliance date for existing sources is three years from the date on which Subpart DDDDD was finalized.

NESHAP Applicability

10 CSR 10-6.080, *Emission Standards for Hazardous Air Pollutants, Subpart M, National Standards for Asbestos*

The requirements of this rule have been summarized and listed in the operating permit.

Other Regulatory Determinations

- 1) The units listed in the "Emission Units Without Limitations" section of this permit either have no applicable regulations associated with them or are considered insignificant activities by the operating permit application. Those units include, but are not limited to, all natural gas/LPG units with a maximum heat input of less than 10 MMBtu/hr and those that burn other fuels and have a heat input of less than 1 MMBtu/hr, storage tanks containing non VOC solvents, and equipment that have been exempted under the construction permit rule.
- 2) The installation uses aqueous solutions for cleaning instead of solvents. Therefore the requirements of the source registration permits for the cold cleaners are not applicable. However, any switch from aqueous cleaners to solvent based cold cleaners could potentially trigger construction permit review.
- 3) 40 CFR Part 64, *Compliance Assurance Monitoring (CAM)*
The CAM rule applies to each pollutant-specific emission unit that meets the following:
 - Be subject to an emission limitation or standard, and
 - Use a control device to achieve compliance, and
 - Have pre-control emissions that exceed or are equivalent to the major source threshold.

40 CFR Part 64 is not applicable because none of the pollutant-specific emission units that use a control device to achieve compliance with a relevant standard has pre-control emissions that exceed or are equivalent to the major source threshold.
- 4) 10 CSR 10-5.030, *Maximum Allowable Emission of Particulate Matter from Fuel Burning Equipment Used for Indirect Heating*
This rule applies to all indirect heating equipment at the installation irrespective of heat input rating. However, in this permit, particulate matter limits have been placed only for indirect heating equipment rated greater than 10 MMBtu/hour (heat input). Equipment that have heat input ratings less than 10 MMBtu/hour have been considered insignificant and not included as applicable units under this rule. However, their heat inputs have been included in calculating the emission limits for new and existing indirect heating equipment.
- 5) 10 CSR 10-5.170, *Control of Odors from Processing of Animal Matter*
This rule is applicable because Sigma-Aldrich Company manufactures some products that are extracted from animal matter such as horsemeat and pig livers. Sigma-Aldrich processes approximately thirty to sixty animal matter batches during a typical year. The batch processing involves the use of either solvents or aqueous solutions for extraction. Some of the processes require heating to achieve better extraction or to denature unwanted by-products. The exhaust (odor) is typically controlled by a condenser when solvents are used. Odors generated during aqueous batches are exhausted to ambient air without any controls. According to the Part 70 application, Sigma-Aldrich Company has not received any odor complaints. This permit does not impose any additional controls other than the requirements of the above rule.
- 6) 10 CSR 10-6.220, *Restriction of Emission of Visible Air Contaminants*
This rule potentially applies to EU1150 (Broadway Installation – Medical Liquid and Powder Nutrient Manufacture), however, since the PM₁₀ potential emissions from the process units and their associated emission points that produce powder products is 0.01 tons per year, the affected units are considered inherently in compliance with the visible emission requirement. Therefore this rule was not included as a permit condition for EU1150..


Other Regulations Not Cited in the Operating Permit or the Above Statement of Basis

Any regulation which is not specifically listed in either the Operating Permit or in the above Statement of Basis does not appear, based on this review, to be an applicable requirement for this installation for one or more of the following reasons:

1. The specific pollutant regulated by that rule is not emitted by the installation;
2. The installation is not in the source category regulated by that rule;
3. The installation is not in the county or specific area that is regulated under the authority of that rule;
4. The installation does not contain the type of emission unit which is regulated by that rule;
5. The rule is only for administrative purposes.

Should a later determination conclude that the installation is subject to one or more of the regulations cited in this Statement of Basis or other regulations which were not cited, the installation shall determine and demonstrate, to the APCP's satisfaction, the installation's compliance with that regulation(s). If the installation is not in compliance with a regulation, which was not previously cited, the installation shall submit to the APCP a schedule for achieving compliance for that regulation(s).

Prepared by:



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